Configuring Microsoft® Windows® Server 2003 on the HP Integrity Server, Enterprise Edition

March 2004 (Second Edition)
Part Number 359984-002

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Contents

Introduction

This document will assist you in configuring Microsoft® Windows® Server 2003 operating system on an HP Integrity server after it has been successfully installed either via the re-install media, or if it has been shipped pre-installed from HP. This guide will assist you in initial preparations to configure the system for a Windows installation. It will also assist you in using the re-installation media to re-install the Windows operating system and perform the final steps to configure Windows on your server. After this is complete, Windows will be ready for normal operation. This guide will also help you to complete the Windows installation if it was pre-loaded on the system by HP.

The following symbols are placed throughout this document. They are to caution you that essential information is presented. Failure to follow directions could result in unsuccessful system setup and preparation.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in unsuccessful system setup and preparation.

IMPORTANT: Text set off in this manner presents essential information to explain a concept or complete a task.

Support for the Setup Procedure

The following will help you set up and configure the HP Integrity server.

- Use the HP Smart Setup media to view and print additional copies of documentation if needed. The Smart Setup media can be used in any IA32 or IA64 Windows system.
- This guide, *Configuring Microsoft® Windows® Server 2003 on the HP Integrity Server, Enterprise Edition* will assist you in using the re-installation media to re-install the Windows operating system and perform the final steps to configure Windows on your server. After this is complete, Windows will be ready for normal operation. It will also help you to complete the Windows installation if it was pre-loaded on the system by HP.
- Support is also available on the HP web site at

  http://www.hp.com/support/itaniumservers

I. Pre-OS System Setup

This section will assist you in configuring an HP Integrity server and preparing it to run Microsoft® Windows® Server 2003.

Use this section for manual installation only. Do not refer to this section if you have ordered the server with the operating system pre-installed by HP.

This section contains the following sections:

- Requirements
- Process Flow
- Overview of the Extensible Firmware Interface (EFI), GUID Partition Table Disks, and Microsoft Reserved Partition (MSR)
- Troubleshooting Tips for the Pre-OS System Setup
- Windows Supported Hardware

Requirements

- HP Smart Setup media
- Microsoft Windows Server 2003, Enterprise Edition (64-bit) CD-ROM
- An HP Integrity server with a minimum of an 800 MHz processor and 2GB of RAM
- One or more Network Interface Cards (NIC)
- One or more hard disk drives
- Two or more clients for testing purposes (optional)
- Drivers, utilities, and manageability agents. The latest versions are located on the HP web site at http://www.hp.com/support/itaniumservers.

Process Flow (High Level View)

1. Perform one of the following installation methods:
   - — Installation through the re-install media.
   - — Install locally using Smart Setup and your volume license for Microsoft Windows Server 2003.
2. Use Express Setup or the System Setup Guide feature from the EFI-Based Setup Utility (EBSU) found on the HP Smart Setup media. This guides you through partition creation, firmware flashing, diagnostics copying, OEM driver loading, and the launching of the Windows OS installer. Other helpful features, such as System Inventory and Drive Explorer are also available through this program.

   Install over the network with RIS/PXE using your volume license for Windows. The HP Integrity Server, rx8620 and rx7620 servers are EFI 1.10 compliant systems. Due to differences between the EFI revision 1.10 and the previous EFI revision 1.02, this QFE is required to support Windows installation via PXE and Remote Installation Services on the HP Integrity Server, rx8620 and rx7620 platforms. Look under \contents\utilities\qfe\RISPXE_QFE on the Smart Setup media 2.0 for a quick fix from Microsoft and instructions on how to work around this issue.
3. Successfully install Microsoft Windows Server 2003 on a server as a standalone system.
4. Perform hardware status check using the Windows Device Manager tool.
5. Install and update drivers and utilities from the HP Smart Setup media.
6. Prepare all logical drives and shared directories.
7. Configure the server's IP address, as needed.
8. Attach clients to the network.
9. Test the network link using the ping utility.
10. Verify that all clients can access the shared directories.
11. Perform a file copy test.

System Setup and Preparation

NOTE: The system setup and preparation are only for cell-based systems. Please use the ParGUI and ParCLI tools for cell-based systems.

Windows and the ACPI flag

CAUTION: HP ACPI Configuration Windows flag must be enabled through this manual process prior to booting to Microsoft Windows Server 2003, Enterprise Edition.

If you ordered your server with Windows pre-installed, the ACPI flag will already be set. To verify that your server is in this mode, ensure that the partition has the ACPI flag set in the Windows mode prior to booting to Windows. This is a required step for all Windows systems. To check this enter: `Shell> acpiconfig.` This should display the ACPI configuration settings: `Windows.`

NOTE: Note that using the default command may cause errors in the efi boot manager menu.

Do the following from the EFI prompt:

```
Shell> default
Shell> acpiconfig windows
windows settings have been enabled.
A reset is required for the settings to take effect.
Shell> reset
```

Your system firmware is now configured to run Windows. If you do not do this step, Windows will display a blue screen, and will not boot successfully.

Once this is set, it will remain set until a firmware flash or repartition of the system is performed using nPartition management tools, such as the nPar Commands or the Par Commands Wizard.

Preparing for Installation

Disconnect all mass storage devices, hard drives from all controllers **except** for the controller that you intend to use as the boot controller. Make a note of where these devices were connected for reconnection later. Doing this makes it much easier to install to the correct device.

Firmware flash and the ACPI flag

If you perform a firmware flash, verify that the ACPI flag is set for Windows after the flash completes. The ACPI flag is persistent, but changes in firmware functionality may affect this flag. To check this enter: `Shell> acpiconfig.` This should display the ACPI configuration settings: `Windows.`

Workaround for manual installation on a cell-based system

Perform this workaround if you are installing manually on a cell-based system to boot successfully. After the first OS reboot (TXTsetup mode) and before the GUI installation is started, the EFI boot manager entry must be modified.

To modify the entry:

1. Break into the boot sequence by pressing any key before the boot manger menu is displayed.
2. Exit to the EFI shell.
3. Use the **NVRBOOT.EFI** utility in the directory **MSutil** to modify the entry. Add the **novesa** switch to the **OsLoadOptions = /redirect /novesa**.
4. Exit the utility, exit the EFI shell, and select the **OS boot entry**.

Timed out waiting for auto-negotiation to complete for only HP Integrity Server

When booting firmware, the following message may be displayed:

```
Timed out waiting for auto-negotiation to complete
```

When this happens, boot is being delayed in the EFI and it will take longer to get to the boot manager menu. This message is coming from the core I/O's 100BT NIC. To stop these delays and messages, you can simply plug a LAN cable into the core I/O LAN port.

To Enable local EFI output over VGA

If using an HP Graphics USB Combo card (A6869A), enable the EFI video to be displayed locally over the VGA by using the following instructions:

1. From the Boot Option Maintenance Menu, select the **active console** device
2. Select the **Active Console Output Devices** (**PCI 5|0 device** for HP Integrity Server), to select the **local VGA card**.
3. Press the space bar to **Enable.**
4. Save.
5. Exit.

At this point, you will need to reset the partition, by typing a reset command at the efi shell.

NOTE: This only needs to be performed on systems that have VGA cards installed.

Location of Cells for the HP Integrity Superdome

Note the numbering scheme given below for the physical location of cells:

```
In cabinet 0: cell 0-7
In cabinet 1: cell 8-15
```

Install/Boot OS hard disk drive is not on the core I/O chassis for the HP Integrity Server

HP strongly recommends that your boot controller is installed in the core I/O chassis. If your boot controller is not in the core I/O chassis, you must run the search command on that cell. This also needs to be performed at the time of every reboot.

For example, if you want to load/detect hard disk drives attached to the Smart Array controller in cell 8 of the partition then issue the following command:

```
Shell> search 8


dec2114x found MAC address xx:xx:xx:xx:xx:xx Name = sni7
Scsi(Pun5,Lun0) PIONEER DVD-ROM DVD-305 1.00 ( 20 MBytes/sec)
(Press <F8> to run the Option ROM Configuration for Arrays
Utility
Press <ESC> to skip configuration and continue
   RAID 4/5/ADG performance may be higher after completion.
```

NOTE: Now you can install the OS to this hard disk drive attached to the Smart-Array controller in cell 8 of the partition. After the installation of the OS is completed it will automatically add the entry in the Boot Manager for that disk, the card will be connected automatically even if it is not on the core I/O chassis.

WARNING: If you reboot the OS the next time you next to run the SEARCH 8 command again to load the driver for the controller. You need to this each time you reboot the operating system.

```
Shell> search 8


dec2114x found MAC address xx:xx:xx:xx:xx:xx Name = sni7
Scsi(Pun5,Lun0) PIONEER DVD-ROM DVD-305 1.00 ( 20 MBytes/sec)
(Press <F8> to run the Option ROM Configuration for Arrays
Utility
Press <ESC> to skip configuration and continue
   RAID 4/5/ADG performance may be higher after completion.
```

Configuring your complex: cell assignments and nPartition management

Two Windows nPartition management tools are available, the nPar Commands (ParCLI) and the Par Commands Wizard (Par Wrapper). Review the *nPartition Management for HP Integrity Servers using Microsoft® Windows®* for your platforms for complete details on partitioning your system and installing partition management tools.

NOTE: Partitions must be placed in Reset for Reconfiguration mode for partition changes to take place. It is recommended you place partitions in Reset for Reconfiguration mode before beginning partition management activites..

Entering Reset For Reconfiguration mode

To enter Reset for Reconfiguration mode, shut down each nPartition operating system. Next, telnet to the MP management processor for the complex. Enter the Command Menu and run the **RR** command for each target partition.

When finished with partition management, boot each partition using the MP Command Menu **BO** command

Each time a DVD or CD is inserted in to the DVD-ROM/CDROM drive after booting to EFI, the map-r command needs to be issued in order for the system to detect it at the EFI shell.

Do the following to issue the `map -r` command:

```
Shell> map -r


Device mapping table
  fs0   : Acpi(000222F0,2)/Pci(1|0)/Scsi(Pun2,Lun0)/CDROM(Entry0)
  fs1   :
Acpi(000222F0,1A)/Pci(1|0)/Pci(4|0)/Scsi(Pun0,Lun0)/HD(Part1,SigCF
5F2D
DC-B885-11D7-B831-000000000000)
  fs2   :
Acpi(000222F0,1A)/Pci(1|0)/Pci(4|0)/Scsi(Pun0,Lun0)/HD(Part2,SigCF
5F32
28-B885-11D7-B831-000000000000)
  blk0  : Acpi(000222F0,2)/Pci(1|0)/Scsi(Pun2,Lun0)
  blk1  : Acpi(000222F0,2)/Pci(1|0)/Scsi(Pun2,Lun0)/CDROM(Entry0)
  blk2  : Acpi(000222F0,1A)/Pci(1|0)/Pci(4|0)/Scsi(Pun0,Lun0)
  blk3  :
Acpi(000222F0,1A)/Pci(1|0)/Pci(4|0)/Scsi(Pun0,Lun0)/HD(Part1,SigCF
5F2
```

The DVD/CD media can now be accessed via FS0.

Each time additional hardware is added to the system after booting to EFI, (ie. HDD, USB device, DVD-ROM drive) a reconnect –r command needs to be issued in order for the system to detect it at the EFI shell.

For example:

```
Shell> help reconnect
RECONNECT devicehandle [driverhandle [childhandle]] | [-r]


   devicehandle : Device handle (hex)
   driverhandle : Driver handle (hex)
   childhandle  : Child handle of device (hex)
    -r          : Reconnect drivers from all devices
```

NOTES:

1. This command disconnects the drivers from the controller, just like 'disconnect', but it then immediately reconnects them.

2. This command tests to see if drivers are following the EFI Driver Model.

3. To find the device handle use the ‘devices’ efi command.

For example:

To reconnect all drivers from all devices:

```
Shell> reconnect -r
```

NOTE: For other optional parameters you can use the dh command to find each of the handle numbers.

Overview of the Extensible Firmware Interface, GUID Partition Table Disks, and Microsoft Reserved Partition

Extensible Firmware Interface

The purpose of the Extensible Firmware Interface (EFI) is to define a common boot environment abstraction layer, which includes EFI drivers, EFI applications, and EFI OS loaders.

The EFI platform interfaces are intended to provide an interface between the platform and the OS that is to boot on the platform. The EFI specification also provides the interface between diagnostics or utility programs and the platform; however, it does not attempt to implement a full diagnostic OS environment. It is envisioned that a small diagnostic OS-like environment can be easily built on top of an EFI system. Such a diagnostic environment is not described in this guide. The EFI, by default, does not support pointing devices for input or bitmaps on output. Microsoft supports EFI as the only firmware interface for booting 64-bit Windows operating systems. Because 64-bit Windows will not boot with the BIOS or the System Abstraction Layer alone, EFI is a requirement for all Intel Itanium-based systems.

NOTE: An Offline Diagnostics and Utilities CD is provided with your server.

GUID Partition Table Disks

Compared to the master boot record (MBR) disk partitioning style, which supports volumes up to 2 terabytes in size and up to 4 primary partitions per disk (or three primary partitions, one extended partition, and unlimited logical drives), GUID Partition table disks (GPT) support volumes up to 18 exabytes in size and up to 128 partitions per disk. Unlike MBR partitioned disks, data critical to platform operation is located in partitions instead of unpartitioned or hidden sectors. In addition, GPT partitioned disks have redundant primary and backup partition tables for improved partition data structure integrity.

Supported File Systems on GPT

The supported file systems on GPT are NTFS, FAT, and FAT32. EFI supports FAT and FAT32.

Disk Management

You can perform the same tasks on GPT disks as you can on MBR disks with the following exceptions:

- Only the Microsoft Windows Server 2003 64-bit OS supports GPT disks. You cannot move GPT disks to computers running the 32-bit version of Microsoft Windows Server 2003. From Disk Management on computers running a 32-bit version of Microsoft Windows Server 2003, GPT disks appear as basic MBR disks with a single partition covering the whole disk, but the data on the partition cannot be accessed.
- The OS loader and boot partition must reside on a GPT disk. Other hard disks can be either MBR or GPT.
- You cannot use the GPT partitioning style on removable media, detachable disks that use Universal Serial Bus (USB) or IEEE 1394 (also called FireWire) interfaces.
- You cannot use the GPT partitioning style on cluster disks that are connected to the shared SCSI or Fiber Channel buses used by the Cluster Service.

However, you can do the following:

- You can have both MBR and GPT disks in a single dynamic disk group.
- You can also have a mix of basic GPT and MBR disks, which are not part of disk groups.
- You can convert an MBR disk to a GPT disk and vice versa only if the disk is empty.

EFI System Partition

The EFI System Partition (ESP) contains files necessary to boot the system, such as drivers.

Creation and Size of the ESP Partition

The creation of the ESP is performed through the EBSU. Boot to the HP Smart Setup media and follow the on-screen instructions in the Smart Setup guide to create the ESP. It will be 100 MB in size.

Contents of the ESP

The ESP should only include files required for booting an OS, platform tools that run before the OS boot, or files that must be accessed before the OS boot, for example, in performing pre-boot system maintenance. Other value-add files or diagnostics used while the OS is running should not be placed in the ESP. It is important to note that the space in the ESP is a limited system resource; its primary purpose is to provide storage for the files necessary to boot the OS.

NOTE: Windows places the loader, and other files necessary to boot the OS in the ESP.

Location of the ESP

The ESP should be first on the disk. While there are no architectural requirements, there are numerous reasons why it is beneficial to place the ESP first. The primary reason for this is that it is impossible to span volumes when the ESP is logically between the two data partitions you are attempting to span. The EBSU will create the ESP as the first partition.

HP Service Partition

The HP Service Partition (HPSP) is created by the EBSU tool found on the HP Smart Setup media. This partition is created to hold the diagnostic tools that are provided on the Offline Diagnostics and Utilities CD. The EBSU program can copy the contents to the HPSP. Start the EBSU program and select “Install Diagnostics” from the main menu.

This partition is recommended by HP but is not required to run the OS. If this partition is not created, storage of offline diagnostics on your hard drive will be unavailable.

CAUTION: If the HPSP is created after the OS is installed, the operating system and other data on this disk will be lost.

Microsoft Reserved Partition

The Microsoft Reserved Partition (MSR) reserves space on each disk drive for subsequent use by the OS software. GPT disks do not allow hidden sectors. Software components that formerly used hidden sectors now allocate portions of the MSR for component-specific partitions. For example, converting a basic disk to a dynamic disk causes the MSR on that disk to be reduced in size and a newly created partition holds the dynamic disk database. Every GPT disk must contain an MSR. It is particularly important that the MSR be created before other primary data partitions.

Creating the MSR

The MSR must be created when disk-partitioning information is first written to the drive. The EBSU will create this partition for you. The EBSU only creates the MSR on the disk designated by the user as the boot disk. Subsequent disks have their MSRs created by the Windows OS.

NOTE: The size of the MSR becomes smaller as it divides into other partitions. The MSR capacity is subject to change.

BootNext variable

To clear the EFI BootNext autoboot variable, press any key before the Boot Manager is displayed. This feature is added to assist in editing the Windows OS loader during installation. After pressing any key the following message displays.

```
Loading BootNext option...

Press any key to cancel EFI BootNext autoboot.

A key was pressed before loading the BootNext variable
Do you want to stop the BootNext process [Y-Yes N-No]?
```

I/O on the HP Integrity Server rx8620/rx7620

HP midrange IA64 servers, the HP Integrity rx8620/rx7620 servers, have a specific mechanism that they use to perform I/O at the EFI shell. This affects the way that partners perform OS installations and where and when they see I/O devices. The HP Integrity rx8620/rx7620 servers observe the following set of rules with regard to I/O.

1. By default, only the core I/O device on each cell is connected at boot time. None of the slots are searched or connected therefore, none of the I/O devices on those slots are visible. At the EFI shell, you can use the search command to search a particular slot or search all the slots on the machine. After you do this, the I/O device on those slots becomes visible. You should do this before you run the OS installer if you want to install to the media that is not on the core I/O.
2. If the OS installer you are using is of the type that specifies incomplete hardware paths for the boot variables, the boot manager will take the following actions at boot time.
    a. For each boot variable the boot manager encounters, it connects the device specified by that variable. If the device has an incomplete hardware path, and it is a GUID partition, then proceed to the next step.
    b. Search an internal database for the GUID that is specified by the boot variable. If it is found in the database, then the hardware path associated with the variable in the database is connected and the process is complete. If the hardware path cannot be connected, then the database entry is invalid and it is purged. Go to the next step if there is no entry in the database or if the entry is invalid.

c. Search the currently connected devices for the GUID specified by the boot variable. If it is found, then update the internal database with the GUID and its associated hardware path and the process is complete. If not, go to the next step.

d. If the GUID cannot be found on any of the currently connected devices, connect all the devices and search for the GUID again. All the devices on the system are connected and another search is made for the GUID. If the GUID is found, then the internal database is updated with the GUID and its associated hardware path. For each boot after this, the machine will only connect the hardware path and the boot time is faster. If the GUID is not found, the media does not exist on the machine and it will not boot.

3. When the machine connects a boot variable, all the partitions on the media that contain the GUID are connected. This solves the problem of installation on multiple partitions on the same media.

4. All this information is stored in the NVM of the machine. If you clear the NVM, all the settings are lost, that is, boot variables, the GUID database, ACPI settings.

Troubleshooting Tips for the Pre-OS Setup

This section provides information about known issues, solutions and workarounds. If you do not have the bootable DVD option at the EFI Boot Manager menu, you will not easily boot your server to the Smart Setup. The steps below will help you add the bootable DVD option to the menu.

Tip 1. Adding a Bootable Media Entry to the EFI Boot Manager Menu

OPTION 1: Using Smart Setup media

1. Power up the server and insert the Smart Setup media into the DVD-ROM drive.
2. When the EFI Boot Manager menu is displayed, use the arrow keys to highlight **EFI Shell [Built-in]**, then press the **Enter** key.
3. The Device Mapping table displays a list of available file system partitions. Locate the fs entry that contains the word CDROM. This file system maps to the DVD drive.

   Example:
   `fs0  : Acpi(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry0)`
4. Type `fs0`: (or use the entry you located above if it was not fs0) at the shell prompt, then press the **Enter** key.
5. Type `\efi\boot\bootia64` at the shell prompt, then press the **Enter** key.
6. Smart Setup EFI-Based Setup Utility (EBSU) will launch. At the main menu, exit this utility immediately by following the prompts to return to the EFI Shell.

To boot the DVD in the future, use the arrow keys to highlight **Internal Bootable DVD** in the **EFI Boot Manager** menu, then press the **Enter** key.

OPTION 2: Manual addition

1. From the Boot Option menu, select **Boot Option Maintenance**.
2. From the main menu of the EFI Boot Maintenance Manager, select **Add a Boot Option**.
3. From the Add a Boot Option menu, select **Removable Media Boot [ACPI].**
4. When prompted, enter the description for this boot option as: `Internal Bootable DVD.`
5. When prompted, enter the Boot Option Data if desired. This description can be blank. Example: `Boot from a Bootable CD or DVD.`
6. When prompted with `Save changes to NVRAM [Y-Yes N-No]:` press the **Y** key. The Add a Boot Option screen appears.
7. Select **Exit**. The Main Menu, Select an Operation screen appears.

8. When prompted with `Save Settings to NVRAM [Y-Yes N-No]:` press the **Y** key.
9. Click **Exit**. You will be brought back to the **Main Menu, Select an Operation** screen.
10. Click **Exit**. The new option appears in the **Boot option** menu.
11. Press the **ESC** key and follow the prompts to return to the EFI Shell.

NOTE: If you want to boot to your DVD drive by default, you must move this to the top of the boot manager menu.

Tip 2. Removing Small Partitions

If you need to completely remove all small partitions (ESP, HPSP and MSR) from the hard disk drive in order to re-use this drive for data, boot your machine to the Smart Setup media, EBSU and follow the instructions to use diskpart.efi.

Tip 3. Hard Disk Drive Capacity Support

Compared to the master boot record (MBR) disk partitioning style, which supports volumes up to 2 terabytes in size and up to 4 primary partitions per disk (or three primary partitions, one extended partition, and unlimited logical drives), GPT supports volumes up to 18 exabytes in size and up to 128 partitions per disk.

NOTE: This is specific to EFI.

Tip 4. Setup VT100 Terminal Emulator for the Serial Port Server Management

NOTE: Microsoft Windows 2000 and XP HyperTerminals do not support VT-UTF8. The Smart Setup media has PUTTY.EXE, which is required for Japanese installation. This can also be used for the English installation.

1. Connect one end of the Null Modem Cable to the COM port of the server.
2. Connect the other end of the Null Modem Cable to one of the COM ports on Terminal Client system (e.g., COM1).
   - The Terminal Client can be a notebook PC, desktop PC, a server, and so on.
   - The Terminal Client must have an OS and HyperTerminal software installed.
3. On the Terminal Client system, verify that the COM port (for example, COM1) is ready for use.
4. Launch **the HyperTerminal** application.
5. Select the COM port to which the Null Modem Cable is connected.

6. Set the following for Port Settings:

   Bits per second: 9600
   Data bits: 8
   Parity: none
   Stop bits: 1
   Flow Control: Xon / Xoff

NOTE: Xon/Xoff is software handshaking and is the standard software method for controlling the data flow. EFI uses Xon/Xoff to communicate via the terminal device instead of "hardware flow." Legacy systems that do not have EFI will use "hardware flow" for controlling the data flow between the devices connected via the serial cable.

The text control flow Xon/Xoff is broken in 64-bit Microsoft Windows Server 2003 versions. Please check the Microsoft web site at http://www.microsoft.com for the latest update

7. Your Terminal Client should now be able to emulate a VT100 terminal.

NOTE: The VT100 Terminal definition and the ASCII character set do not support all keys on a standard U.S. 101 keyboard, nor do they support all the characters necessary for international keyboards. A VT100 emulator does not support displaying output in color.

NOTE: For support of VT-UTF8 Hp recommends using PUTTY.exe which is included on the HP Smart Setup media.

Conventions for Keys Not in VT100 Terminal Definition and ASCII Character Set

Keyboard	Sequence	Keyboard	Sequence	Keyboard	Sequence
Home Key	<ESC>h	Function 1	<ESC>1	Function 7	<ESC>7
End Key	<ESC>k	Function 2	<ESC>2	Function 8	<ESC>8
Insert Key	<ESC>+	Function 3	<ESC>3	Function 9	<ESC>9
Delete Key	<ESC>-	Function 4	<ESC>4	Function 10	<ESC>0
Page Up key	<ESC>?	Function 5	<ESC>5	Function 11	<ESC>!
Page Down	<ESC>/	Function 6	<ESC>6	Function 12	<ESC>@
Line Feed	^J	Cursor Up	<ESC>[A	Turn on blinking	<ESC>[5m
Home Cursor	<ESC>[H	Cursor Down	<ESC>[B	Turn on bold	<ESC>[1M
Backspace	^H	Cursor Forward	<ESC>[C	Tab	^I
Escape	<ESC>, <ESC>	Cursor Backward	<ESC>[D	Back tab	<ESC>[Z

NOTE: Key sequences beginning with <ESC> must be presses quickly otherwise they will not be recognized by the computer.

How do I configure the terminal emulator to connect to the Japanese edition of Microsoft Windows Server 2003 using Putty.exe

The client operating system is running Microsoft Windows Server 2003 English

Perform the following steps to change the appropriate Language and Regional settings to Japanese and change the font used by the HyperTerminal to display correctly.

1. On the client system, adjust the Regional and Language settings in the Control Panel to Japanese region and language.
2. In the Control Panel, Regional and Language Settings, Languages tab, select **Install files for East Asian Languages.**
3. In the Regional Options tab, select **Japanese**.
4. In the Advanced tab, select **Japanese** in the Non-Unicode Programs section and place a checkmark next to **10001 (MAC - Japanese).** You will need to reboot for the changes to take effect.
5. After the reboot, run the HyperTerminal and select **VT-UTF8 emulation** and the **MS Mincho** font.

The client operating system is running Microsoft Windows Server 2000 Japanese

PUTTY.EXE is required because the VT-UTF8 emulation is not supported in the Microsoft Windows Server 2000 or Windows XP version of the HyperTerminal.

From the Putty Configuration > Windows > Translation, select **VT-UTF8** in the Character set translation on received data.

The client operating system is running Microsoft Windows Server 2000 English

PUTTY.EXE is required because the VT-UTF8 emulation is not supported in the Microsoft Windows Server 2000 version of the HyperTerminal.

1. On the client system, adjust the Regional and Language settings in the Control Panel to Japanese region and language.
2. In the Control Panel, Regional and Language Settings, Languages tab, select **Install files for East Asian Languages.**
3. In the Regional Options tab, select **Japanese**.
4. In the Advanced tab, select **Japanese** in the Non-Unicode Programs section and place a checkmark next to **10001 (MAC - Japanese).** You will need to reboot for the changes to take effect.
5. After the reboot, run PUTTY.EXE.
6. From the **Putty Configuration > Windows > Translation**, select **VT-UTF8** in the Character set translation on received data.
7. From the **Putty Configuration > Windows > Appearance**, select the **MS Mincho** font in Set the font used in the terminal window.

8. Click **Open** in the Putty Configuration window.

Tip 5. How to Check Your System Firmware Version

In the EFI Shell, type the following command:

```
Shell:>info fw
```

This command will show all your system firmware versions. The firmware versions of the cards can be checked in the EBSU Maintain Firmware feature.

Tip 6. EFI Shell Commands

Most shell commands can be invoked from the EFI shell prompt. However there are several commands that are only available for use from within batch script files. The Batch-only column indicates that the command is only available from within the script files. The following sections provide more details on each of the individual commands. Some of these commands may not be available in some models.

EFI Shell Commands

Command	Batch-only	Description
alias	No	Displays, creates, or deletes aliases in the EFI shell
attrib	No	Displays or changes the attributes of files or directories
bcfg	No	Displays/modifies the driver/boot configuration
break	No	Executes a debugger break point
cd	No	Displays or changes the current directory
cls	No	Clears the standard output with an optional background color
comp	No	Compares the contents of two files
connect	No	Binds an EFI driver to a device and starts the driver
cp	No	Copies one or more files/directories to another location
date	No	Displays the current date or sets the date in the system
dblk	No	Displays the contents of blocks from a block device
devices	No	Displays the list of devices being managed by EFI drivers

Command	Batch-only	Description
devtree	No	Displays the tree of devices that follow the EFI Driver Model
dh	No	Displays the handles in the EFI environment
disconnect	No	Disconnects one or more drivers from a device
dmem	No	Displays the contents of memory
dmpstore	No	Displays all NVRAM variables
drivers	No	Displays the list of drivers that follow the EFI Driver Model
drvcfg	No	Invokes the Driver Configuration Protocol
drvdiag	No	Invokes the Driver Diagnostics Protocol
echo	No	Displays messages or turns command echoing on or off
edit	No	Edits an ASCII or UNICODE file in full screen.
efiCompress	No	Compresses a file
efiDecompress	No	Decompresses a file
err	No	Displays or changes the error level
exit	No	Exits the EFI Shell
for/endfor	Yes	Executes commands for each item in a set of items
getmtc	No	Displays the current monotonic counter value
goto	Yes	Makes batch file execution jump to another location
guid	No	Displays all the GUIDs in the EFI environment
help	No	Displays commands list or verbose help of a command
hexedit	No	Edits with hex mode in full screen
If/endif	Yes	Executes commands in specified conditions
load	No	Loads EFI drivers
loadBmp	No	Displays a Bitmap file on the screen
loadPciRom	No	Loads a PCI Option ROM image from a file
ls	No	Displays a list of files and subdirectories in a directory

Command	Batch-only	Description
map	No	Displays or defines mappings
memmap	No	Displays the memory map
mkdir	No	Creates one or more directories
mm	No	Displays or modifies MEM/IO/PCI
mode	No	Displays or changes the mode of the console output device
mount	No	Mounts a file system on a block device
mv	No	Moves one or more files/directories to destination
openInfo	No	Displays the protocols on a handle and the agents
pause	No	Prints a message and suspends for keyboard input
pci	No	Displays PCI devices or PCI function configuration space
reconnect	No	Reconnects one or more drivers from a device
reset	No	Resets the system
rm	No	Deletes one or more files or directories
set	No	Displays, creates, changes or deletes EFI environment variables
setsize	No	Sets the size of a file
stall	No	Stalls the processor for some microseconds
time	No	Displays the current time or sets the time of the system
touch	No	Sets the time and date of a file to the current time and date
type	No	Displays the contents of a file
unload	No	Unloads a protocol image
ver	No	Displays the version information
vol	No	Displays the volume information of the file system

Tip 7. MSR Creation by Microsoft

If you choose to have the Microsoft installer create the MSR partition, the MSR must be the first partition after the ESP on the disk.

NOTE: This is not recommended. HP recommends using the EBSU to create all small partitions like the ESP, HPSP and the MSR.

If the Microsoft installer partitions the disk during setup, it creates the MSR. If the EBSU partitions the disk, it creates the MSR. If the MSR is created after the disk is partitioned, there will be no free space left to create an MSR. The EBSU creates an MSR only if the HPSP was created.

When initially created, the size of the MSR depends on the size of the disk drive:

- On drives less than 16 GB in size, the MSR is 32 MB.
- On drives greater than or equal to 16 GB, the MSR is 128 MB.

Using the Manageability Processor (With No Local VGA/Mouse/Keyboard)

Set Up Local Console via VT100 Terminal Emulator

1. Obtain a client system.
2. Install either Windows 2000 Professional or XP on the client system.
3. Use Window Hyper Terminal to emulate VT100.
   a. If the Manageability Processor LAN port already has the static IP address assigned to it, then you can use the Telnet feature of the Hyper Terminal to connect to the Manageability Processor remotely.
   b. If the Manageability Processor LAN port does not have the static IP address assigned to it, then you can use the NULL MODEM cable to connect to the MP serial port of the HP Integrity rx7620, or the Local Console port of the HP Integrity rx7620 and use a local system to connect to it via Hyper Terminal's COM port.

Connect to MP

1. Log on to your system Manageability Processor via the local console or LAN connection.
2. Enter "MP login:" Admin and "MP password:" Admin.
3. Verify Manageability Processor's LAN port has a static IP address.
4. Press **ctrl+b** to see the MP prompt (press **ctrl+e**, then type **c**, then **f** if prompted, then press **ctrl+b**).
5. Type CM to get the MP prompt.

   For the HP Integrity server:

   a. Type LS at the MP prompt
   b. Type LC at the MP prompt if you want to assign IP address then follow the instructions on the screen.

Go to the EFI Shell

Log on to the HP Integrity Systems EFI Shell.

For the HP Integrity server:

```
MP MAIN MENU:
   CO: Consoles
   VFP: Virtual Front Panel
   CM: Command Menu
   CL: Console Logs
   SL: Show Event Logs
   HE: Help
   X: Exit Connection
   MP> CO
```

PXE / RIS

The following information is regarding the PXE Boot Remote installation setup.

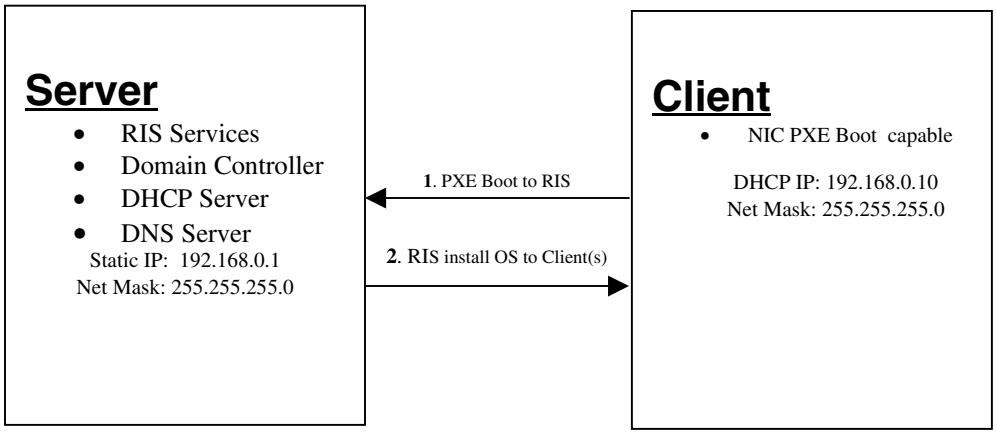
IMPORTANT: This process can be done via the local install via video/keyboard/mouse or the express install via Manageability Processor.

Required components:

1. A server with a RIS (Remote Installation Services) setup and configured
2. A server with a Domain Controller setup and configured
3. A server with a DNS server setup and configured

4. A server with a DHCP server setup and configured
5. A server or a Client with integrated or plug-in PCI NIC capable of PXE functionality

Normally, the Domain Controller, the DNS server, and the DHCP server are set up on different servers. However, in this case we will set them all on the same server plus the RIS to save additional servers.



Server

The following are steps for setting up Remote Installation Services (RIS).

1. Install Microsoft Windows Server 2003.
2. Configure the primary NIC to use it as a static IP address.
3. Install Remote Installation services.
4. Set up and configure Remote Installation services.
5. Set up PXE Boot Client.
6. Install Microsoft Windows Server 2003.
7. Configure the primary NIC to use as a static IP address.

   IP address: xxx.xxx.x.x

   Net Mask: xxx.xxx.xxx.x

   Gateway: xxx.xxx.x.x

   Primary DNS: xxx.xxx.x.x

II. Re-installation of the OS

This section covers how to use the re-installation media to either restore your system to a fresh installation of Microsoft® Windows®, or to install Windows from the re-installation media on to an existing system that previously ran the HP-UX or Linux operating systems.

Information in this section is also helpful when setting up a server that has an OS pre-installed. Please refer to the topics discussing completion of the mini-setup process.

1. Critical Information (steps to be performed prior to booting Windows)

   While using the re-install media, you may experience unusual behavior, or issues. This section covers those issues.

2. Installation

   a. Installing Microsoft Windows Server 2003 with an Operating System Re-install Media Provided by HP

   b. Starting Up the System after Re-installing the OS from the HP Re-install Media

   c. Headless Mini-Setup Boot

   d. Re-installing Using the Headless Console

Requirements

- Re-installation media or Microsoft Windows Server 2003, Enterprise Edition
- An HP Integrity server that has successfully configured hardware
- The HP Integrity Server, rx8620 and rx7620 servers are EFI 1.10 compliant systems. Due to differences between the EFI revision 1.10 and the previous EFI revision 1.02, this QFE is required to support Windows installation via PXE and Remote Installation Services on the HP Integrity Server, rx8620 and rx7620 platforms. Look under \contents\utilities\qfe\RISPXE_QFE on the Smart Setup media 2.0 for a quick fix from Microsoft and instructions on how to work around this issue.

Critical Information

PNP Delay During OS Installation

PNP delay takes at least 10 to 15 minutes per I/O chassis at installation time.

It will take 30 to 90 minutes to complete the installation process because the OS PNP engine takes about 10 to 15 minutes to complete initializing each I/O chassis with I/O cards fully populated.

Avoiding Confusion on Which Drive is Receiving the Image

In a local installation to a server with multiple HDDs, it is easy to remove all the drives but the target drive to avoid confusion as to which drive is about to receive the image.

During a remote installation, in the absence of distinguishing volume labels, it is easy to confuse the volumes and even destroy a drive while selecting the target partition.

NOTE: HP Server Agents should be installed after all devices are connected, otherwise fibre channel agents may not install.

Installation Planning Sheet

Complete the following planning sheet before you begin the installation process. You will need this information in order to answer questions that you will be asked during the installation process.

Partition Table: _____(List target partitions)

User Name: _____

Organization: _____

Licensing: _____

Computer Name: _____

Admin Password: _____

Date Time Zone: _____

Workgroup or Domain Name: _____

Registration Key: _____

Capacity Planning/Performance Baselining

The best practices of Capacity Planning / Performance Baselining are beyond the scope of this document. However, it is important to have performance data from the server so that planning for extra capacity or troubleshooting sudden performance problems can be done more readily. Performance baselining involves recording and storing performance data when performance is acceptable, in order to compare it to unacceptable performance. Archived performance logs can be invaluable data for troubleshooting problems.

The following counters are a good starting point for capacity planning:

Object	Counters
Processor	Percent of Processor Time
Memory	Pages/sec, Available Bytes, Commit Limit, Committed Bytes, Pool Non-Paged Bytes
Paging File	Percent of Usage Peak
Physical Disk	Percent of Disk Time, Avg. Disk Seconds/Transfer
Logical Disk	Percent of Free Space
Network Segment	Percent of Network Utilization
Network Int.	Bytes sent, received, and total

NOTE: This is by no means a definitive list of counters to include.

The data obtained from these objects can be used for both support and planning purposes. The data can be reviewed each day to see if the thresholds are being hit.

For example, if the percent of Processor time is > 80%, or if the Available bytes are < 1 MB on a File and Print server, or if the Physical Disk percent of Disk Time is > 67%, or if the percent of Free Space is < 5%, or if the Network Segment percent of Network Utilization is > 40 % on an Ethernet segment for an extended period of time, the Problem Management group within a company may want to know about the system that is having the problem.

Installation Methods

There are several ways of installing Microsoft Windows Server 2003. The most popular methods are listed below. The method you choose depends on your system and its configuration. Select a method and go to the appropriate section of this guide to begin.

Before you begin, verify the following:

- The server's video controller is working.
- The server's video controller displays the EFI Boot Manager menu and EFI Shell prompt.
- The server's USB keyboard is functioning in the EFI Boot Manager menu and EFI Shell prompt.

These three steps are only necessary if doing a local install with mouse/monitor. Select an installation method:

- Installing Microsoft Windows Server 2003 locally with an Operating System Re-install media provided by the hardware manufacturer (if your system was purchased preloaded), or manually from the Microsoft OS media

  OR

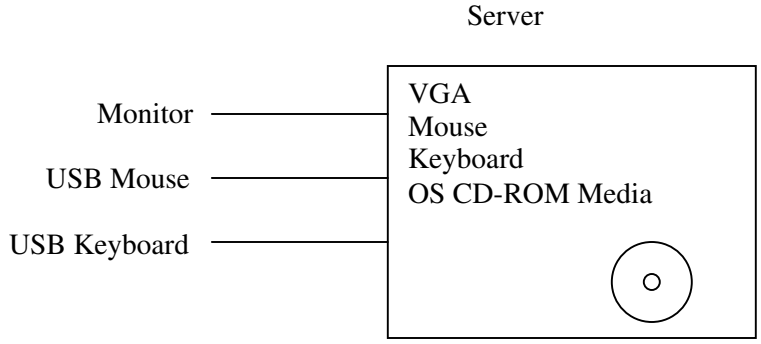
- Perform the installation manually from the Microsoft operating system media by first using the Smart Setup media for the initial system configuration preparation.

  OR

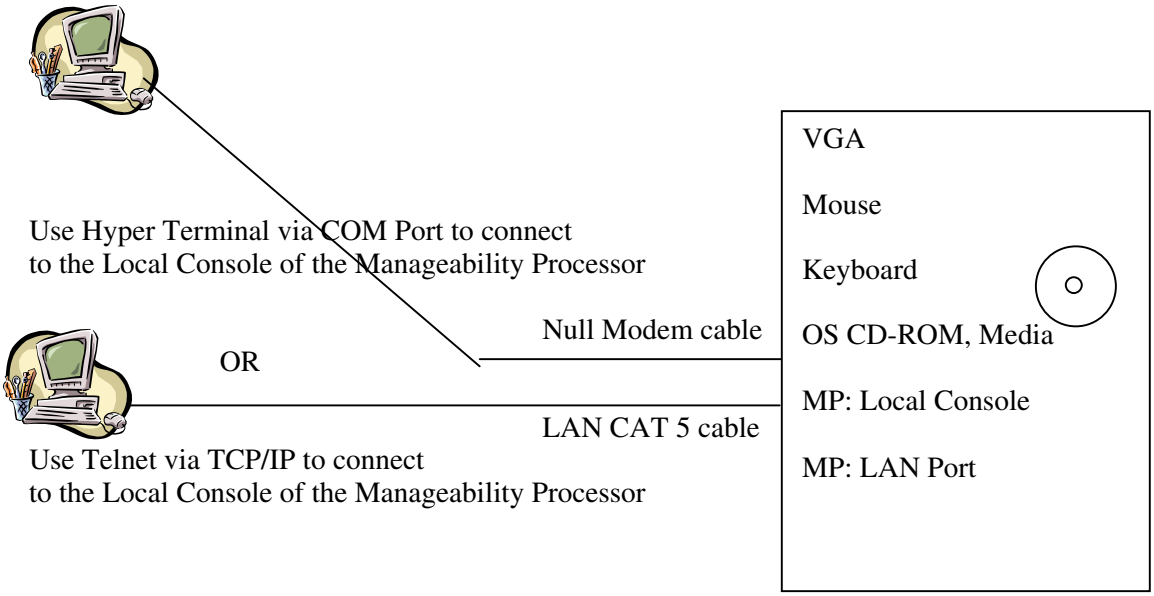
- Installing Microsoft Windows Server 2003 over the network with PXE/RIS (Pre-eXecution Environment/Remote Install Server).

NOTE: The above installation methods can be performed via local video/mouse/keyboard or via Manageability Processor (remote).

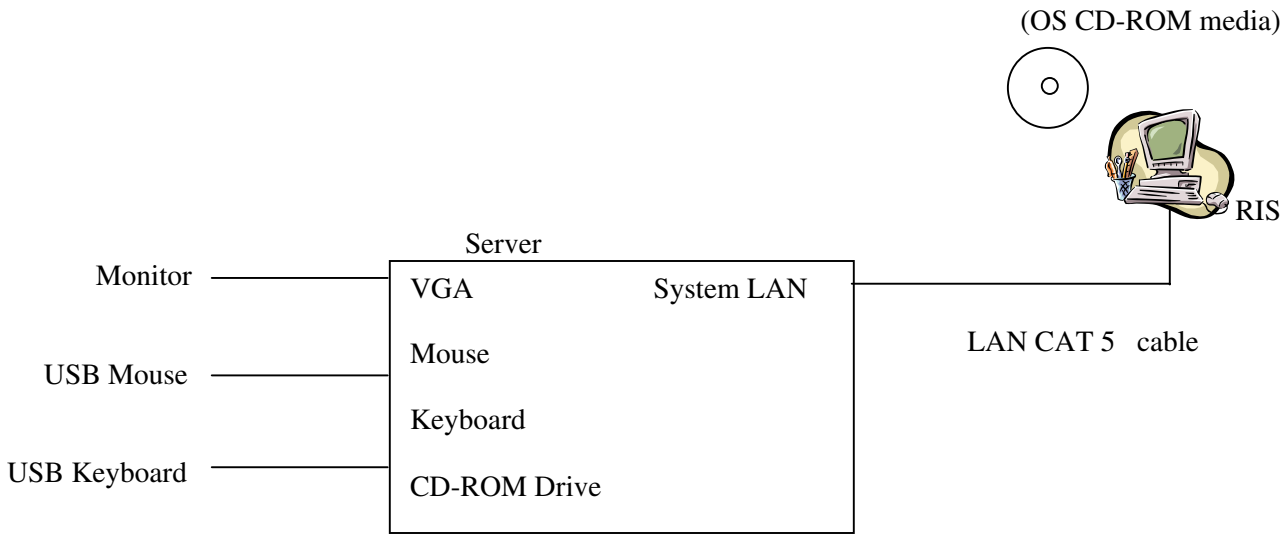
Local Install with Video/Mouse/Keyboard



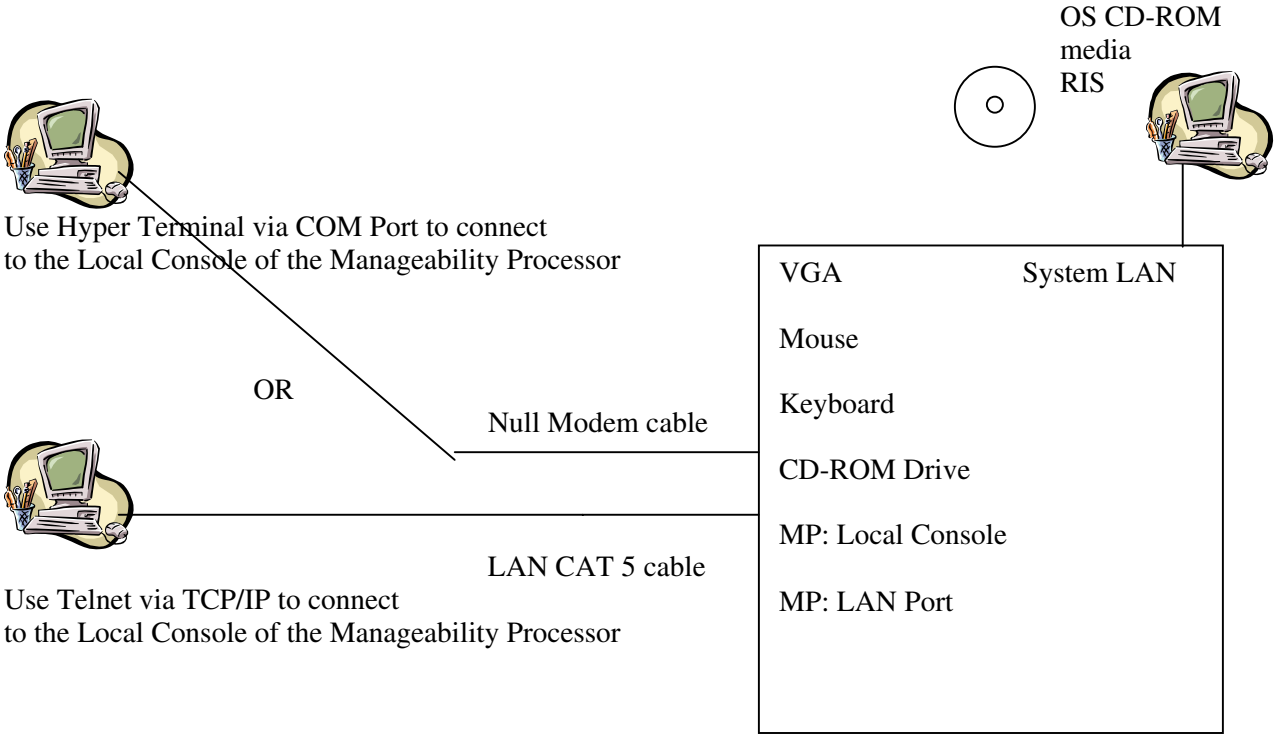
Remote/Express Install



PXE/RIS – Local Install



PXE/RIS – Remote/Express Install



Booting HP Integrity Servers Preloaded with Microsoft Windows Server 2003 Operating System

Setting Up the Server's Video and Basic USB Input Devices

1. Insert the USB keyboard in one of the server's USB connectors.
2. Insert the USB mouse in the one of the server's USB connectors.
3. Connect a display monitor to the server's video controller.

Out of the Box-Initial System Startup

Step	Goal	How
1	Power on the system and answer the Windows Mini-setup questions.	1. Power on the system. 2. Windows displays a popup screen indicating that an EMS channel (this is the remote management console) is present. **Note:** It may take a couple of minutes for the mouse and keyboard to start working during this phase of the startup process. **Please wait.** If you wish to complete the installation from the EMS channel, then do nothing at the local console and proceed to enter the following information from the EMS console. If you wish to complete the installation from the local console, then Click **OK** and proceed to enter the following information from the local console. 3. Click **Next** in the **Welcome to the Windows Setup Wizard** window. 4. Click **I Accept,** and then **Next** in the **License Agreement** window. 5. Click **Next** in the **Regional and Language Options** window. 6. Enter your name and organization, then and click **Next** in the **Personalize Your Software** window. 7. Enter the product key and click **Next** in the **Your Product Key** window. This ID is located on the label attached to your computer. 8. Select the appropriate license purchased and click **Next** in the **Licensing Modes** window. 9. Enter the computer name and password, and click **Next** in the **Computer Name and Administrator Password** window. 10. Select the correct date and time zone and click **Next** in the **Date and Time** window.

continued

Out of the Box-Initial System Startup *continued*

Step	Goal	How
2	Complete Setup Wizard and boot Windows.	1. The server will reboot and go into the EFI BOOT manager. 2. The server boots immediately to Windows. 3. Press the **Alt+Ctl+Del** keys. Enter the password to login as an Administrator. 4. Double-click **Online Reference**. 5. Read the information provided here. If desired, you can install optional utilities from this section.

Installing Microsoft Windows Server 2003 with an Operating System Re-install Media Provided by HP with a local connection

If your system has the USB EFI firmware and driver loaded then you will be able to navigate through the EFI Shell and perform the installation without setting up the Hyper Terminal VT100 terminal emulator. The VT100 terminal emulator allows you to see and navigate in the EFI Boot Manager, EFI Shell environments, and the text setup section of the OS only.

Setting Up the Server's Video and Basic USB Input Devices

Perform the following steps if your USB and video is not enabled.

1. Insert the USB keyboard in one of the server's USB connectors.
2. Insert the USB mouse in the one of the server's USB connectors
3. Connect a display monitor to the server's video controller.
4. Power the server to test the video and USB functions in the EFI shell environment.
5. Verify that the USB keyboard is working in the EFI Shell and the video can display the EFI Boot manager and EFI Shell screen then proceed to “Install the Operating System Locally.”

NOTE: The EFI shell does not support mouse input. USB mouse operation may be verified during the Windows OS installation.

Reinstalling the OS from the HP Reinstall Media

Use the following table to reinstall the OS from the HP reinstall media.

Reinstalling the OS from the HP Reinstall Media

Step	Goal	How
1	Prepare the system and boot from the reinstall media.	1. Configure your boot controller and drive. If you are using a Raid adapter, follow the Raid installation guide to prepare the adapter and configure the Raid type. **WARNING**: The installation will be done to the boot controller detected as adapter zero drive zero. **It is recommended that you remove all drives but the one on the boot controller before starting the re-installation process. Doing this makes it easier to install to the correct drive. If you do not do this, you may not be able to install the device you wish to boot from. This is a limitation of the Windows setup.** 2. Insert the HP Reinstallation Media into the DVD drive. 3. Boot from this media by doing one of the following: Select **Bootable DVD** from EFI boot manager if one is present. or Select **EFI Shell** and type the following commands. 4. Select the DVD file system. For example, type `fs1:<cr>.` 5. Start the loader by typing `setupldr<CR>.`
2	Restore System	1. Click **Re-install.** 2. Enter the desired partition size: 16 G 32 G Max (Maximum drive size) 3. Click **OK** to continue. 4. Wait until the files are copied from DVD to hard drive. **Note:** The restore process will display 99% complete for a very long time. Do not power off the system. Wait until this process is completed. 5. Read the message displayed. 6. At the dialog box, click **OK** to continue.
3	Exit Re-install media and boot Windows	1. Click **Exit** to reboot the system. 2. The system boots immediately to Windows. 3. Follow the “Initial system setup” instructions listed in the section titled “Out of the box – Initial System Startup.”

Starting Up the System after Reinstalling the OS from the HP Reinstall Media using local installation with video/mouse/keyboard

Refer to the following table for directions on initial system startup after reinstalling the OS from the HP reinstall media.

Initial System Startup after Reinstalling the OS from the HP Reinstall Media

Step	Goal	How
1	Power on the System and answer the Windows Mini-setup questions.	1. Power on the system. Windows displays a popup screen indicating that an EMS channel (this is the remote management console) is present. **Note:** It may take a couple of minutes for the mouse and keyboard to start working during this phase of the startup process. **Please wait.** 2. If you wish to complete the installation from the EMS channel, then do nothing at the local console and proceed to enter the following information from the EMS console. If you wish to complete the installation from the local console, then click **OK** and proceed to enter the following information from the local console. 3. Click **Next** in the **Welcome to the Windows Setup Wizard** window. 4. Click **I Accept,** then click **Next** in the **License Agreement** window. 5. Click **Next** in the **Regional and Language Options** window. 6. Enter your name and organization in the proper fields, and click **Next** in the **Personalize Your Software** window. 7. Enter the product key, and click **Next** in the **Your Product Key** window. This ID is located on the label attached to your computer. 8. Select the appropriate license purchased and click **Next** in the **Licensing Modes** window. 9. Enter the **c**omputer name and password in the proper fields, and click **Next** in the **Computer Name and Administrator Password** window. 10. Select the proper date and time zone, and click **Next** in the **Date and Time** window.

continued

Initial System Startup after Reinstalling the OS from the HP Reinstall Media *continued*

Step	Goal	How
2	Complete the Setup Wizard and boot Windows.	1. The server will reboot and go into the EFI BOOT manager. The system boots immediately to Windows. 2. Press the **Ctrl+Alt+Del** keys. Enter the password to login as an Administrator. 3. Double-click **Online Reference.** Read the information provided here. If desired, you can install optional utilities from this section.

Installing Microsoft Windows Server 2003 with the Microsoft CD-ROM using local installation with video/mouse/keyboard

If your system has the USB EFI firmware and driver loaded, then you will be able to navigate through the EFI Shell and perform the installation without setting up the Hyper Terminal VT100 terminal emulator. The VT100 terminal emulator allows you to see and navigate in the EFI Boot Manager, EFI Shell environments, and the text setup section of the OS.

Setting Up a Server's Video and Basic USB Input Devices

1. Insert the USB keyboard in one of the server's USB connectors.
2. Insert the USB mouse in one of the server's USB connectors
3. Connect a display monitor to the server's video controller.
4. Power the server to test the video and USB functions in the EFI shell environment
5. Verify that the USB keyboard is working in the EFI Shell and that the server's video controller can display the EFI Boot manager and EFI Shell screen. When finished, go to the next section, "Installing the Operating System Locally."

Installing the Operating System Locally Via Local Video/Mouse/Keyboard

1. Power on the server. Use the Smart Setup guided installation from the EFI.
2. After creation of the ESP, HPSP and MSR partitions from the HP Smart Setup media, insert the Microsoft Windows Server 2003 CD-ROM in the DVD-ROM drive of the server.
3. In the EFI Boot Manager, you will see the following options:

```
EFI Shell [Built-in]
Boot Option Maintenance menu
```

4. Select **EFI Shell [Built-in].**

5. Under the "Device mapping table" of the EFI Shell, locate and select the DVD device (**fs0**) for example:

```
fs0 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry1)
blk0 : Acpi(PNP0A03,1)/Pci(1|0)/Scsi(Pun0,Lun0)
blk1 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)
blk2 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry1)
```

6. Type `fs0:` and then press the **Enter** key.
7. Once in fs0:\>, enter the command `dir`.
8. From fs0:\>, the file **SETUPLDR.EFI** and the directory the EFI should be listed.
9. To install the OS, enter the command `setupldr.efi`.
10. Press the **Enter** key to continue at the Setup Notification screen.
11. Press the **Enter** key to continue at the Welcome to Setup screen.
12. Choose whether to perform an Express setup or a Custom setup at the following screen prompt: `Windows setup can automatically configure most aspects of your…`
    a. If you choose to perform the Express setup, press the **Enter** key, and go to the section “Express Setup Process” below.
    b. If you choose to perform a Custom setup, press the **C** key, and go to the section “Custom Setup Process” below.

Express Setup Process

1. Enter an administrator password for the server. It is important that you **do not lose or forget the administrator password**.
2. The installation will recognize that the ESP, HPSP and MSR partitions have already been created by the HP Smart Setup media.
3. Press the **F8** key (via USB keyboard or **ESC + 8** via Hyper Terminal Emulator) to accept the licensing agreement.
4. At the Drives Partitioning screen, select the desired partition on the target drive. If you want to use the entire partition to install Microsoft Windows Server 2003, press the **Enter** key. Otherwise, press the **C** key to create a partition on the drive.

NOTE: In this example, we will create a 10 GB partition. Please note that Microsoft Windows Server 2003 does not have the 2GB partition size limitation, which is present on Windows NT 4.0.

5. Highlight **Unpartitioned space** on the target drive.
6. Press the **C** key to create a partition on the target drive. A screen displays that indicates the amount of unpartitioned space available.
7. Enter the desired partition size in the **Create partition of size (in MB):** field. For 10 GB, enter the number 10240.
8. Press the **Enter** key.
9. Highlight the 10 GB partition you just created on the target drive and press the **Enter** key. A screen displays, informing you that the partition you selected is not formatted.

10. Highlight **Format the partition using the NTFS file system** and press the **Enter** key.

The installer will format and copy files to the hard drive. The system will then reboot.

NOTE: Set the NOVESA Boot Option. Refer to the section 'Setting the NOVESA Boot Option' later in this guide.

11. At the EMS Connection Detected dialog box, select the desired option.
    - — If you are planning to install via the local VGA/Mouse/Keyboard, then click **OK** to continue with the installation.
    - — If you are planning to install the unattended express installation, or prefer installing the unattended express installation, **DO NOT click on OK**. Proceed to your Remote Client's Hyper Terminal Session. Follow the instructions in the "Remote/Express Install Via Manageability Processor" section.
12. The Installing Components screen starts with a progress bar chart. It takes about 40 minutes to complete this section. The wizard will then start the "Performing Final Tasks" section to complete the installation.

NOTE: If you see a dialog box titled **Digital Signature Not Found**, click **Yes** to continue the installation and read Tip 3 in the "Troubleshooting Tips" section of this guide.

13. Click **Finish** to complete the installation. Remove the CD-ROM from the drive. The system will then reboot from the hard drive.

NOTE: After installation completes, the server may display a dialog box indicating that one or more minor errors occurred during installation. Click **OK,** then perform the following steps, and then check the status of all the hardware drivers in the "Hardware Status Check" section.

14. Follow the instructions on the screen to logon. Use your USB keyboard to enter the user-id and password.

Custom Setup Process

1. Press the **C** key (custom setup), to allow you to create the primary data partition manually if you have not already done so or if your disk is new (clean/unformatted).
2. The installation will recognize that the ESP, HPSP and MSR partitions have already been created by the HP Smart Setup media.
3. Press the **F8** key (via the USB keyboard or **ESC + 8** via Hyper Terminal Emulator) to accept the licensing agreement.
4. At the Drives Partitioning screen, select the desired partition on the target drive. If you want to use the entire partition to install Microsoft Windows Server 2003, press the **Enter** key. Otherwise, press the **C** key to create a partition on the drive.

NOTE: In this example we will create a 10 GB partition. Please note that Microsoft Windows Server 2003 does not have the 2GB partition size limitation, which is present on Windows NT 4.0.

5. Highlight **Unpartitioned space** on the target drive.
6. Press the **C** key to create a partition on the target drive. A screen displays, indicating the amount of unpartitioned space available.

7. Enter the desired partition size in the Create partition of size (in MB): field. For 10 GB, enter the number 10240.
8. Press the **Enter** key.
9. Highlight the 10 GB partition you just created on the target drive and press the **Enter** key. A screen informs you that the partition you selected is not formatted.
10. Highlight **Format the partition using the NTFS file system** and press the **Enter** key.

    The installer will format and copy files to the hard drive. The system will then reboot.

NOTE: Set the NOVESA Boot Option. Please refer to the section 'Setting the NOVESA Boot Option' later in this guide.

11. At the EMS Connection Detected dialog box, select the desired option.
    - — If you are planning to install via the local VGA/Mouse/Keyboard then click **OK** to continue with the installation.
    - — If you are planning to install via the unattended express installation or prefer installing via the unattended express installation, **DO NOT click OK**. Move on to your Remote Client's Hyper Terminal Session. Follow the instructions in the "Remote/Express Install Via Manageability Processor: Express Setup Process" section.
12. The Installing Components screen starts with a progress bar chart. It takes about 40 minutes to complete this section. The wizard will then start the "Performing Final Tasks" operation to complete the installation.

NOTE: If you see a dialog box titled **Digital Signature Not Found**, click **Yes** to continue the installation and read Microsoft® Windows® Server 2003, Enterprise Edition, Driver Signatures section of this guide.

13. Click **Next** at the Regional and Language Options screen.
14. At the Personalize Your Software screen, enter a name and organization. Then click **Next**.
15. Enter the product license key.
16. Select **Per Seat** (at the **Licensing modes** screen). Then click **Next**.
17. At the Computer Name and Administrator Password prompt, type in your computer name, administrator password and password confirmation. Then click **Next**.
18. Enter the correct date and time and click **Next**. The **Networking Setting** screen starts with a progress bar chart.
19. Click **Next** to accept the default typical settings.
20. Click **Next** at the Workgroup or Computer Domain to accept the defaults:

    No, this computer is not on a network, or is on a network without a domain…

    and

    Workgroup or computer domain: WORKGROUP

21. The Installing Windows screen starts with a progress bar chart. It takes about 30 minutes to complete this section. The wizard will then start the "Performing Final Tasks" section to complete the installation.
22. Click **Finish** to complete the installation. Remove the CD-ROM from the drive. The system will then reboot from the hard drive.

NOTE: After installation completes, the server may display a dialog box indicating that one or more minor errors occurred during installation. Click **OK** and perform the following steps, and then check the status of all the hardware drivers in the “Hardware Status Check” section.

23. Follow the instructions on the screen to logon. Use your USB keyboard to enter the user-id and password.
24. After logging on for the first time, the server displays the Manage Your Server window.
25. The server automatically displays the start menu. If you wish to view the start menu in the Windows 2000 format, move your mouse over the gray part of the window and right-click the mouse.
26. Highlight **Properties** and left-click the mouse.
27. Select **Classic Start menu** and click on **OK**.
28. You can now access the server desktop in the same manner as Windows 2000.

Installing Remote/Express Via Manageability Processor (With No Local VGA/Mouse/Keyboard) on HP Integrity Servers

IMPORTANT:

The DB9 (9 pin male) COM port is used to display EFI Shell output and Windows output such as SAC> prompt. It cannot be used to access the system Manageability Processor. On the other hand, the Manageability Console ports such as LAN port or Local port can be used to access the Manageability Processor, but it cannot display Windows output such as SAC> prompt. If you want to install Microsoft Windows server 2003 and view the output via Manageability Console ports through the LAN port or Local port you need do the following for the Integrity system before proceed with the Remote/Express install via Manageability Processor.

1. Boot the HP Integrity server to the EFI Boot Manager menu.
2. Select **Boot Option Maintenance Menu**.
3. Highlight **Select Active Console Output Devices.**
4. Deselect **Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+).**
5. Save settings to NVRAM.
6. Select **Select Active Console Input Devices.**
7. Deselect **Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+).**
8. Save settings to NVRAM.
9. Select **Select Active Standard Error Devices.**
10. Deselect **Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+).**

By unselecting these options, it will turn off DB9 (9 pin male) CONSOLE PORT and redirect all Windows EMS information to the Manageability Processor's LAN/Local ports.

11. Save settings to NVRAM.

If you want to turn on/enable the DB9 (9 pin male) CONSOLE PORT again, you have to do the following:

NOTE: The `DEFAULT CLEAR` command will clear all NVRAM settings, including the operating system boot loader, EFI Shell [Built-in], media boot option, etc. Make sure you know how to import all the boot options once you clear it.

a. Go to the EFI Shell.

b. At the EFI Shell prompt, type `default clear (only for cell-based systems)`.

   The `default clear` will clear all NVRAM settings and restore it to the factory default.

   The DB9 (9 pin male) CONSOLE PORT is now turned on/enabled.

c. Import your operating system boot loader and others boot options that you like.

Remote/Express Install Requirements

1. Connect to the MP.
2. Go to your EFI Shell.
3. Install Windows:
   - The TEXT setup mode can be managed via the MP/Hyper Terminal.
   - Select **Express Setup Only.**
   - Finish the TEXT setup progress

   Wait until the GUI setup state finishes and the OS reboots

NOTE: Set the NOVESA Boot Option. Please refer to the section 'Setting the NOVESA Boot Option' later in this guide.

4. From the SAC prompt, assign the IP address for one of the NICs.
5. From the SAC prompt, create another CMD channel and go to C:\WINDOW\SYSTEM32\ to enable Terminal Services via the registry key and type the following:

   ```
   reg add "HKLM\System\CurrentControlSet\Control\Terminal Server"
   /v fDenyTSConnections /t REG_DWORD /d 0 /f
   ```

   Refer to your hardware guide.

6. From the remote desktop, logon to the operating system via the NIC that you just assigned to the IP address

Set Up Microsoft Windows Server 2003

NOTE: For support of VT-UTF8 Hp recommends using PUTTY.exe which is included on the HP Smart Setup media.

Conventions for Keys Not in VT100 Terminal Definition and ASCII Character Set

Keyboard	Sequence	Keyboard	Sequence	Keyboard	Sequence
Home Key	<ESC>h	Function 1	<ESC>1	Function 7	<ESC>7
End Key	<ESC>k	Function 2	<ESC>2	Function 8	<ESC>8
Insert Key	<ESC>+	Function 3	<ESC>3	Function 9	<ESC>9
Delete Key	<ESC>-	Function 4	<ESC>4	Function 10	<ESC>0
Page Up key	<ESC>?	Function 5	<ESC>5	Function 11	<ESC>!
Page Down	<ESC>/	Function 6	<ESC>6	Function 12	<ESC>@
Line Feed	^J	Cursor Up	<ESC>[A	Turn on blinking	<ESC>[5m
Home Cursor	<ESC>[H	Cursor Down	<ESC>[B	Turn on bold	<ESC>[1M
Backspace	^H	Cursor Forward	<ESC>[C	Tab	^I
Escape	<ESC>, <ESC>	Cursor Backward	<ESC>[D	Back tab	<ESC>[Z

NOTE: Key sequences beginning with <ESC> must be pressed quickly otherwise they will not be recognized by the computer.

NOTE: The text control flow Xon/Xoff via hyperterminal may not be working in 64-bit versions of Microsoft Windows Server 2003. Please check the Microsoft web site at http://www.microsoft.com for the latest update

To begin the installation:

1. Power on the server locally or via the Manageability Processor.
2. Insert the Microsoft Windows Server 2003 CD-ROM in the DVD-ROM drive of the server.
3. In the EFI Boot Manager, you will see the following options:

   ```
   EFI Shell [Built-in]
   Boot option maintenance menu
   ```

4. Select **EFI Shell [Built-in].**
5. Under the Device mapping table of the EFI Shell, locate and select the DVD-ROM device (fs0) for example:

   ```
   fs0 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry1)
   blk0 : Acpi(PNP0A03,1)/Pci(1|0)/Scsi(Pun0,Lun0)
   blk1 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)
   blk2 : Acpi(PNP0A03,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry1)
   ```

6. Type `fs0:` and then press the **Enter** key.

7. Once in fs0:\>, enter the command `DIR`.
8. From fs0:\>, the file SETUPLDR.EFI and the directory EFI should be listed.
9. To install the OS, enter the command `SETUPLDR.EFI`.
10. Press the **Enter** key to continue at the Setup Notification screen.
11. Press the **Enter** key to continue at the Welcome to Setup screen.
12. Choose to perform the Express setup or the Custom setup at the screen prompt: `Windows setup can automatically configure most aspect of your…`
13. Select **Express** setup and proceed to the section "Express Setup Process."

Express Setup Process

1. Enter an administrator password for the server. It is important that you **do not lose or forget the administrator password**.
2. After pressing the **Enter** key for the express setup, if the dialog window informs you `Setup could not locate an existing system partition,` press the **Enter** key to allow the installation to create the ESP and MSR partitions for you automatically. This happens if the disk has been cleaned earlier or the disk is RAW.

NOTE: The HP recommended method of creating these partitions is with the HP Smart Setup media using EBSU.

3. The Microsoft installation creates an MSR and EFI system partition automatically on the first drive it selects if not already created. The screen will indicate that the installation is formatting the drive.
4. Press the **F8** key (via the USB keyboard or **ESC** + **8** via Hyper Terminal Emulator) to accept the licensing agreement.

NOTE: If you press the **ESC** key and do not press the 8 key immediately, Windows will reboot the system.

5. In the drives partitioning screen, select the desired partition on the target drive. If you want to use the entire partition to install Microsoft Windows Server 2003, press the **Enter** key. Otherwise, press the **C** key to create a partition on the drive.

NOTE: In this example we will create a 10GB partition. Please note that Microsoft Windows Server 2003 does not have the 2GB partition size limitation, which is present on Windows NT 4.0.

6. Highlight **Unpartitioned space** on the target drive.
7. Press the **C** key to create a partition on the target drive. A screen displays, indicating the amount of unpartitioned space available
8. Enter the desired partition size in the Create partition of size (in MB): field. For 10 GB, enter the number 10240.
9. Press the **Enter** key.
10. Highlight the 10 GB partition you just created on the target drive and press the **Enter** key. A screen displays, informing you that the partition you selected is not formatted.
11. Highlight **Format the partition using the NTFS file system** and press the **Enter** key.

The installer will format and copy files to the hard drive. The system will then reboot.

NOTE: Set the NOVESA Boot Option. Please refer to the section 'Setting the NOVESA Boot Option' later in this guide.

12. At the SAC> prompt, press the **ESC** key, then the **TAB** key. Press the **ENTER** key to switch to another CMD channel to view the **License Agreement** screen.
13. At the **License Agreement** screen, press the **ESC+8** keys in rapid succession to accept the license agreement and continue with the installation.

NOTE: If you press the **ESC** key and do not press the **8** key right away, Windows will reboot the system.

14. Enter Product ID: `xxxxx-xxxxx-xxxxx-xxxxx-xxxxx` and then press the **Enter** key.
15. Enter the Administrator password.
16. Press any key to switch back to the SAC> prompt to continue the installation.

    At this stage it takes about 40 minutes to complete the installation.

    During this time, if you want to view the install process, switch to another channel.

SAC Prompt – Switch Channel

At the SAC prompts press the **ESC+Tab** keys.

This will switch to another channel, which is the installation process of Microsoft Windows Server 2003.

How to Log onto Windows Remotely

1. Wait until the GUI setup state finishes and the OS reboots.
2. From the SAC prompt, assign the IP address for one of the NICs.
3. From the SAC prompt, create another CMD channel and go to C:\WINDOW\SYSTEM32\ to enable Terminal Service via the registry key and type the following:

   ```
   reg add "HKLM\System\CurrentControlSet\Control\Terminal Server" /v
   fDenyTSConnections /t REG_DWORD /d 0 /f
   ```

4. From the remote desktop, logon to the HP Servers via the NIC that you just assigned the IP address to.
5. Follow the instructions below.

SAC – Assign IP address for LAN on HP Integrity systems

1. At the SAC prompts, type: `I`.
2. Locate the LAN on the HP Integrity server that is connected to the corporation network.
3. At the SAC prompts, type: `<#> <ip> <subnet> <gateway>`

   ```
   i     2     "x"."x".xxx.xxx   xxx.xxx.xxx.0     "x"."x".xxx.x
   ```

NOTE: If you restart the system, this setting will be gone. You must perform step 3 again. Therefore, you need to assign this IP address to the same LAN again after you successfully log on to Windows.

Create SAC Channels

The following are channel management commands.

Use ch -? for more help.

ch List all channels.

Create a command prompt channel.

Type: cmd, space, enter

Result: cmd0001

Type: ch

Result: cmd0001 is channel 1

Type: ch –sn cmd0001 or ch –si 1 (this will open channel 1 for use) or press the **ESC** and then **TAB** keys.

Press any key to view channel 1 (cmd0001).

SAC Channel – Login Windows

NOTE: To be able to see the options below the OS must be installed and loaded. Otherwise different options will show up.

Type: `ch –sn cmd0001 or ch –si 1` (this will open channel 1 for use)

Press any key to view channel 1 (cmd0001).

When the USER NAME option displays, type `ADMINISTRATOR`.

When the DOMAIN option displays, press the **ENTER** key.

When the PASSWORD option displays, type in the administrator password of the OS.

NOTE: This is the password that you entered during the Express setup.

Update Registry to Enable Terminal Server

At the C:\>Windows\Systems32, type the following:

```
reg add "HKLM\System\CurrentControlSet\Control\Terminal Server" /v
fDenyTSConnections /t REG_DWORD /d 0 /f
```

Then press the **ENTER** key. You should see:

```
The operation completed successfully.
```

Remote Control Session: Launch Remote Desktop from Client System

1. Launch Remote Desktop (usually located in Accessories>Communication).
2. Enter the IP address of the LAN on the HP Integrity server that is connected to the corporation network.
3. Enter ADMINISTRATOR and the password in the User name and password boxes.

Headless Mini-Setup Boot

Microsoft Windows Servers 2003 uses the remote console port to interact with the user during the Mini-Setup phase of the boot process. Microsoft refers to this as EMS (Emergency Management Services). HP refers to this port as the headless console port.

This Mini-Setup phase is encountered the first time you boot a server after the image is restored with the re-install media.

The following instructions provide a step-by-step process to complete the OS boot using the headless console MP port. Please note that this could either be the LAN or serial port on the MP card.

Please note the following:

1. The Windows XP client includes the terminal server client in the accessories>communication folder.
2. Microsoft Windows 2000 requires that you install the TS client.
3. This document does not provide details on how to run and configure the hyperterminal.
4. This document does not provide details on how to configure the MP console ports.

Connect to the target system partition with the terminal emulator and go to step 12 in the section, “Re-installing using the Headless Console.”

Example 1: The following example connects to partition zero.

```
MP login: Admin
MP password: Admin <Or Whatever password>
```

```
[server name] MP> co

   Partitions available:

   #   Name
   ---  ----
   0)  Partition 0
   1)  Partition 1
   2)  Partition 2
   4)  Partition 4
   5)  Partition 5
   Q)  Quit
   Please select partition number: 0
SAC>
```

Re-installing Using the Headless Console

1. Mount the DVD in the DVD-ROM drive.
2. From the remote console reset the partition.

Example 2: The following reset example is for partition zero.

```
MP login: Admin
MP password: Admin (or whatever your password is.)
[server name] MP> cm
[server name] MP:CM> rs
This command resets the selected partition.
```

WARNING: Execution of this command halts all system processing and I/O activity irrecoverably and restarts the selected partition.

```
   #   Name
   ---  ----
   0)  Partition 0
   1)  Partition 1
   2)  Partition 2
   4)  Partition 4
   5)  Partition 5
   Select a partition number: 0

   Do you want to reset partition number 0? (Y/[N])Y
```

======== End of a Reset example ==========

3. At the remote console select to boot DVD from EFI boot manager or type `setupldr` at the EFI prompt.
   For Example:
   `Sehell> setupldr <Enter>`
4. On the headless console, at the **SAC>** prompt type `CMD`.
5. Press the **Esc+Tab** keys to switch to the new command prompt channel.
6. Start the installation menu by typing `txtrestore`.
7. Select the partition size.
8. Wait for the restore to finish.
9. Use the instructions provided on the screen on how to restart the computer.
10. After the system boots on the main console or VGA display, if one is present, a screen will be displayed indicating that the EMS was detected. Click OK if you want to use the local console KB/MS. **Do not click OK**.
11. Go to the remote console and wait for the **SAC>** prompt.
12. Press the **Esc+Tab** keys to switch to channel one. You will get the following information:

```
**************************************************************
Name:                   Unattended Setup Channel
Description:            Provide parameters to automate Setup
Type:                   VT-UTF8
Channel GUID:           0cfc0ee2-3a27-11d7-8484-806e6f6e6963
Application Type GUID: 00000000-0000-0000-0000-000000000000

Press <esc><tab> for next channel.
Press <esc><tab>0 to return to the SAC channel.
Use any other key to view this channel.
**************************************************************
```

13. Press any key to start the channel data link.

```
Press PAGE DOWN for next page.
```

14. Press the **F8** key to accept the license agreement.

NOTE: F8 = <Escape>8 is for the Windows default terminal emulator. Also, make sure you press the number 8 within two seconds after pressing <Esc>. Otherwise, the system will reboot because it only read the <Esc> key.

```
The 25-character Product Key appears on the lower section of your
Certificate of Authenticity.
```

```
Type the Product Key below in the form
XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

15. Product ID: Enter the PID with a - as the separator, for example:

```
>> XXXXX-XXXXX-XXXXX-XXXXX-XXXXX

Enter the password that will be used for the Administrator Account
on this machine. This field must not be blank. Administrator
Password:
```

16. xxxxxx (This is an example)

```
Please re-enter the Administrator password.

Password Confirmation:
```

17. xxxxxx (This is an example)

```
Setup will now proceed in an automated fashion.


* Wait for MiniSetup to complete.

* The system will reboot.

* The system shows the SAC> prompt.


* If you don't have a DHCP server, obtain the IP address to
connect with terminal server services. Please note that the "I"
command can also be used to change the IP Address to match your
network.


SAC>i

Net: 2, Ip=192.168.0.225  Subnet=255.255.255.0
Gateway=192.168.0.1

*Open

Windows XP or Windows 2000 terminal server client and connect to
192.168.0.255 and change the computer name and IP address if
needed.
```

When headless installation is performed, the registered user and company names are not configured. Please perform the steps listed below to enter the appropriate information.

1. Open the **OnlineReference** page on the desktop.
2. Scroll to the bottom of display and click the hotlink **c:\hputils\usercompanyname.com.**
3. Click **Open**
4. Answer each prompt with the company name and user name.
5. Confirm information and click **OK.**
6. Run **systeminfo.exe** from the command prompt to verify the changes.

III. Configuring Windows

This section will assist you in configuring Microsoft® Windows® on your HP Integrity server after it has been successfully installed either via the re-install media, or if it has been shipped pre-installed from HP.

Information in the following sections provide:

1. Critical Information-tips for Windows
2. Completion of Windows installation
3. Configuring the OS after the installation is complete
4. Troubleshooting Tips for configuring Windows

Requirements

An HP Integrity server fully setup and configured with Microsoft Windows Server 2003 installed.

Critical Information

NVR Boot – Boot Option Maintenance

Setting the NOVESA Boot Option-Manual Installation only

NOTE: Systems preloaded with Windows from HP or re-installed media already have the NOVESA configuration added.

There is an issue with the legacy VGA driver in Windows that requires disabling extended VESA modes during installs using the /NOVESA boot option. This is done automatically as part of the pre-loaded Windows installation.

Do not remove this flag. Although it is primarily needed for installation, removing it may cause a blue screen to display in the future under certain circumstances (possible examples: if you update Windows, or if you move your VGA card to a different slot, or if you add another I/O chassis to your partition).

How to Add/Remove/Verify the /NOVESA Flag in the OS Boot Loader

1. From the EFI Shell, go to the MSUTIL directory and execute the `NVRBOOT.EFI` command.

```
fs1:\> dir
Directory of: fs1:\
```

```
    07/17/03  11:48a                  127  fail_file.txt
    03/25/03  05:00a              841,216  SETUPLDR.EFI
    06/25/03  11:14a <DIR>          1,024  EFI
    06/25/03  11:14a <DIR>          1,024  MSUtil
            2 File(s)     841,343 bytes
            2 Dir(s)

  fs1:\> cd msutil
  fs1:\MSUtil> nvrboot
NVRBOOT: OS Boot Options Maintenance Tool [Version 5.2.3683]

 * 1. Windows Server 2003, Enterprise
   2. EFI Shell [Built-in]

  * = Windows OS boot option


    (D)isplay (M)odify (C)opy E(x)port (I)mport (E)rase (P)ush
  (H)elp (Q)uit
```

2. Select **M(Modify)** to modify the OS boot loader.

   ```
   Select> m
   ```

3. Enter the OS boot option to modify.

   ```
   Enter OS boot option to modify: 1
   ```

4. Enter VAR to modify: 2
   a. LoadIdentifier = Windows Server 2003, Enterprise
   b. OsLoadOptions = /REDIRECT
   c. EfiOsLoaderFilePath = cf5f2ddc-b885-11d7-b831-000000000000 :: \efi\microsoft\winnt50\ia64ldr.efi

d. OsLoaderFilePath = e605a034-b885-11d7-b831-000000000000 :: \windows

```
Enter var to modify: 2
```

5. Retype OsLoadOptions without the /NOVESA option (to remove it from the Os Boot Loader).

```
Enter var to modify: 2
OsLoadOptions = /redirect / NOVESA
```

6. The /NOVESA is in the OsLoadOptions.
   a. LoadIdentifier = Windows Server 2003, Enterprise
   b. OsLoadOptions = /redirect/NOVESA
   c. EfiOsLoaderFilePath = cf5f2ddc-b885-11d7-b831-000000000000 :: \efi\microsoft\winnt50\ia64ldr.efi
   d. OsLoaderFilePath = e605a034-b885-11d7-b831-000000000000 :: \windows
7. Exit and boot the OS.

Completion of Windows Installation

How to Log onto Windows Remotely using SAC (if not using the re-installation media)

1. Wait until the GUI setup state finishes and the OS reboots.
2. From the SAC prompt, assign the IP address for one of the NICs.
3. From the SAC prompt, create another CMD channel and go to C:\WINDOW\SYSTEM32\ to enable Terminal Service via the registry key and type the following:

```
reg add "HKLM\System\CurrentControlSet\Control\Terminal Server" /v
fDenyTSConnections /t REG_DWORD /d 0 /f
```

4. From the remote desktop, logon to the HP Servers via the NIC that you just assigned the IP address to.
5. Follow the instructions below.

Assign IP Address for LAN on HP Integrity systems via SAC Prompt

1. At the SAC prompts, type: `I`.
2. Locate the LAN on the HP Integrity system that is connected to the corporation network.
3. At the SAC prompts, type: `<#> <ip> <subnet> <gateway>`

```
i     2     "x"."x".xxx.xxx   xxx.xxx.xxx.x     "x"."x".xxx.x
```

NOTE: If you restart the system then this setting will be gone. You need to perform step 3 again. Therefore, you need to assign this IP address to the same LAN again after you successfully log on to Windows. If you successfully login using remote desktop to perform this, it will remain after future reboots.

Create SAC Channels

The following are channel management commands.

Wait for the message shown below or press **<Esc><Tab>** to switch to channel one. You will get the following information.

********** MESSAGE **********
Name: Unattended Setup Channel
Description: Provide parameters to automate Setup
Type: VT-UTF8
Channel GUID: 0cfc0ee2-3a27-11d7-8484-806e6f6e6963
Application Type GUID: 00000000-0000-0000-0000-000000000000

Press <esc><tab> for next channel.
Press <esc><tab>0 to return to the SAC channel.
Use any other key to view this channel.
****

Login to Windows using SAC

After creating a SAC channel continue with the steps below to log on.

Type: `ch -sn cmd0001 or ch -si 1` (this will open channel 1 for use)

Press any key to view channel 1 (cmd0001).

When the USER NAME option displays, type `ADMINISTRATOR`.

When the DOMAIN option displays, press the **ENTER** key.

When the PASSWORD option displays, type in the administrator password of the OS.

NOTE: This is the password that you entered during the Express setup.

How to Log on to Windows in a headless configuration

1. From the SAC prompt get the IP address, if no IP address is assign set the IP address for one of the NICs. When an IP address is set from SAC it is only temporary and will be lost on a system reboot. To permanently set the IP you need to log into Windows and set the IP.

NOTE: This is enabled by default in the systems preloaded or re-installed with Windows. Perform the steps below only if you are manually installing from the Microsoft media.

2. From a remote desktop, logon to the HP Integrity servers via the NIC that you just assigned the IP address to.
3. Follow the instructions below.

How to Launch Remote Desktop

1. Launch Remote Desktop (usually located in Accessories◊Communication).
2. Enter the IP address of the LAN on the HP Integrity server that is connected to the corporation network.
3. Enter the Administrator and password in the User name and password boxes.

Hardware Status Check

After Windows is installed, verify that you have all current drivers installed.

Run the Windows Device Manager tool to identify any issues with the installed devices or resource conflicts.

1. Right click **My Computer.**
2. Click **Properties**. This brings up the System Properties menu.
3. Click on the **Hardware** tab.
4. Click **Device Manager**.
5. Verify that the device does not have either a yellow (!) symbol or a question mark (?) next to it.

   NOTE: A yellow (`!`) means that there is a resource issue with the device. A question mark (`?`) means that the device is unknown.

6. If neither (`!`) nor the (`?`) symbols are reported, then hardware status check is complete and you can skip to step 8.

   If you see the above symbols listed for any hardware, go to step 7.

7. Double-click on each of the devices with either symbol. The device properties dialog box will appear. Or, if a printer is available, use the **View**, **Print** option from the menu to get a report.

   The Device status field indicates why the device has (`!`) or (`?`) symbols.

   For example, the field may show, `The drivers for this device are not installed (Code 28)`. You must install the correct driver for this device in order for the device to work properly and to remove the (`!`) or (`?`) symbols.

   a. Obtain these drivers from Smart Setup. Additionally, verify that all driver versions are current by checking www.hp.com/support/itaniumservers for the latest version of drivers.

      Once the appropriate driver is found, the Hardware Update Wizard copies it to the appropriate directory and installs it for the device. If the Hardware Update Wizard finds more than one version, it will display all the versions available. Make sure that you select the version that is on the floppy disk. Click **Next**.

   b. When the Hardware Update Wizard finishes installing the driver, it will display a window indicating the wizard has finished installing the software for the device (the device name will also be displayed).

c. Click **Finish**.

d. Close the device properties window.

e. The Device Manager window has now been updated to reflect that the proper driver has been installed for the device.

The device no longer has a (`!`) or (`?`) symbol next to it.

8. Verify if the installed drivers are digitally signed.

a. In the Device Manager, click on the device (e.g. HP Smart Array) that you want to verify.

b. Right-click on that device.

c. Select **Properties.**

d. Click on the **Driver** tab

e. Locate the "Digital Signature:" If the driver of that device is digitally signed then it will display `MS Windows Server 2003 Enterprise Server Publisher` or `Microsoft Windows Hardware Compatibility Publisher.`

NOTE: If the driver of the device is not digitally signed, we recommend that you check the HP web site at http://www.hp.com/support/itaniumservers for the latest driver package. If there is a later version available, install the new driver(s).

9. Exit the Device Manager and system properties application.

10. Check the Event Viewer to make sure that there are no errors in the log.

11. Click on **Start>Programs>Administrative tools>Event viewer.**

12. When the Event Viewer is displayed, click S**ystem** in the left panel.

13. Double-click on all warnings and errors in the right panel to display information about that specific warning or error.

14. When done, exit the Event Viewer.

Configure the IP Address

During the installation process, the server was configured to use DHCP. If no DHCP server is found on the network the system will auto-configure a random IP address to start functioning. It is important that you configure the proper IP address to be able to communicate with the clients. Follow the steps below to configure the server's IP address.

1. After logging in using the remote desktop, right-click **My Network Places**.

2. Click **Properties**.

3. Double-click **Local Area Connection**. There is one Local Area Connection icon for each Network Interface Card (NIC) present on the system. Identify the proper NIC by browsing each one.

4. Click on the **General** tab on the Local Area Connection Properties screen.

5. Select **Internet Protocol (TCP/IP).**

6. Click **Properties**.
7. Click **Use the following IP address**.
8. Enter the appropriate IP address selected on the planning section listed above. For example 100.100.100.1.

NOTE: If the IP address of the DNS server is available, then enter the appropriate DNS IP address.

9. Make sure that you enter a valid subnet mask value.
10. Click **OK** to continue.
11. Click **OK** in the Local Area Connection Properties box to assign an IP address to the Network Interface Card.
12. Ensure that the Network Interface Card is physically connected to your network.

    If the Network Interface Card is not connected to the network, you will not be able to test the link.
13. Open a command prompt window to verify the TCP/IP configuration. Enter the command:

    ```
    ipconfig /all
    ```

    If the server has a physical connection to the network and a valid IP address with a subnet mask, the command prompt window will display the configuration information you entered above.
14. Test the link by entering the following at the command prompt:

    ```
    ping computername
    ```

    Where *computername* is the server name. The server should reply four times. If the server does not reply, there is a link problem which must be fixed before going any further.
15. Test the link by doing a ping to one of the clients attached to the server, for example:

    ```
    ping 100.100.100.2
    ```

    The client should reply four times.

Attach Clients to the Network

Follow the normal procedure to patch the clients to the proper hub with the server.

Configuring Terminal Services for Application Mode

NOTE: Remote Administration mode is enabled by default on all installations of Microsoft Windows Server 2003. To set up Terminal Service to run in Application Mode, follow the instructions in the "Adding Terminal Server Services," section above. Also, the Terminal Server Service does not allow two users with the same logon name to log in at the same time.

1. Open the Control Panel.
2. Double-click **Add Remove Programs**.
3. Click **Add/Remove Windows Components**.
4. Scroll to and select **Terminal Server**.
5. Click **Next**.
6. Click **Next** at the Terminal Server Setup screen.
7. Click **Next** at the next screen to accept the default Full Security.
8. If prompted, insert the Microsoft Windows Server 2003 CD-ROM.
9. Click **Finish** to close the Wizard.
10. Click **Yes** to restart the system. (Remove the CD-ROM.)
11. After the system reboots, log in to the system.
12. Open the Control Panel.
13. Open the Administrative Tools folder. You should see the following icons present: Terminal Server Licensing, Terminal Services Configuration, and Terminal Services Manager.

Set up Remote Desktop Connection (IA32 computer)

You can obtain a copy of the remote desktop utility, if needed, on your client from the C:\windows\systems\clients directory on your IPF system. When you have obtained the utility do the following:

1. Copy all the files in the TSclient\win32 directory to a floppy or other media.
2. On the client system, create a directory and put all the files there.
3. Select the **setup file** and click it to install the remote desktop utilities.
4. Follow the installation instructions in the **Remote Desktop connection - InstallShield Wizard** screen.

NOTE: You may also use this Terminal Services client software component to display or use programs by connecting to, and using, the services of Microsoft Windows NT Server 4.0, Terminal Server Edition, and Microsoft Windows 2000 OS products.

The Remote Desktop Connection Utility's setup files are also located in the C:\Windows\system32\clients\tsclient\win32\ directory.

Set up Remote Desktop Connection (IA64 computer)

NOTE: Remote Administration mode is enabled by default on all installations of Microsoft Windows Server 2003. To setup Terminal Service to run in Application Mode, follow the instructions in the "Adding Terminal Server Services," section. Also, the Terminal Server Service does not allow two users with the same logon name to log in at the same time.

1. Click **Start>Programs>Accessories>Communications>Remote Desktop Connection**.
2. Click the **Computer** dropdown box.
3. Select **Browse for more.**
4. Select the appropriate computer name in the Browse for computers dialog box.
5. Click **OK**.
6. Click **Connect**.
7. Log on with a valid user name and password.
8. You should see a remote desktop window for the computer you selected.

NOTE: You may see the minimized version of the remote connection window at the top of your screen. Click on the maximize button.

Setting up the Kernel Debugger

DUI Interface Cable

Materials

Quantity	Item
1	L-Com **SD9S** DB9F Solder-tail Connector
1	L-Com **SDC9G** DB9F Shroud Assembly
1	Molex **50-57-9005** 5 Position Crimp Terminal Housing
5	Molex **16-02-0102** Crimp Terminal
10 ft	CAT-5 Cable

Connection Table

Wire Color	Header Pin	DB9F Pin
Orange/White	NC	5
Orange	2	3
Green/White	3	5
Blue	4	8
Blue/White	NC	NC
Green	1	2
Brown/White	NC	NC
Brown	5	7

Windows Kernel Debugger Port

The HP Integrity rx8620 and rx7620 have a kernel debugger port that is shared with a support debug port (used by the HP field personnel). It is an RJ45 port that can be used with a special cable converting it to a DB9 connector. The location and required wiring is detailed in the included diagram.

The default state for this shared port is to be used as the support debug port, and therefore, is not enabled for use as a Windows kernel debugger. To enable the port for Windows kernel debugging, you may use the provided EFI application called kd.efi. This is needed in addition to the standard operating system enablement of the port by using the /DEBUG and /BAUDRATE boot options in Windows. The "`kd`" application has two options, "-on" and "-off". For example, to turn on the port, you must run at the EFI shell:

```
Shell> kd -on
============================
KD Kernel Debug Port Enabler
============================
The KD port has been turned ON
Any changes to the KD port will remain persistent
across reboots and power down, as long as power
is supplied to the server.
Shell>
```

Changing it's value is persistent across reboots and power-downs. It is only reset to the default support debug port state on the loss of power to the server or the use of "kd -off" from the EFI shell.

Connection Table

DB9F Pin	Wire Color	RJ45 Pin
5	Orange/White	1
3	Orange	2
5	Green/White	3
8	Blue	4
NC	Blue/White	5
2	Green	6
NC	Brown/White	7
7	Brown	8

Debug Options

How to Add the DEBUG Flag in the OS Boot Loader

1. From the EFI Shell, go to the MSUTIL directory and execute the NVRBOOT.EFI command.

```
fs1:\> dir
Directory of: fs1:\

   07/17/03  11:48a                  127  fail_file.txt
   03/25/03  05:00a              841,216  SETUPLDR.EFI
   06/25/03  11:14a <DIR>          1,024  EFI
   06/25/03  11:14a <DIR>          1,024  MSUtil
         2 File(s)     841,343 bytes
         2 Dir(s)

fs1:\> cd msutil
fs1:\MSUtil> nvrboot
```

2. Select **M(Modify)** to modify the OS boot loader.

```
Select> m
```

3. Enter OS boot option to modify.

```
Enter OS boot option to modify: 1
Enter VAR to modify: 2
```

   a. LoadIdentifier = Windows Server 2003, Enterprise

   b. OsLoadOptions = /REDIRECT /NOVESA

c. EfiOsLoaderFilePath = cf5f2ddc-b885-11d7-b831-000000000000 :: \efi\microsoft\winnt50\ia64ldr.efi

d. OsLoaderFilePath = e605a034-b885-11d7-b831-000000000000 :: \windows

e. Enter var to modify: 2

4. Retype OsLoadOptions with the /DEBUG /BAUDRATE=115200 option.

```
Enter var to modify: 2
OsLoadOptions = /REDIRECT /NOVESA /DEBUG /BAUDRATE=115200
```

5. The /DEBUG /BAUDRATE=115200 is now in the OsLoadOptions.

   a. LoadIdentifier = Windows Server 2003, Enterprise

   b. OsLoadOptions = /REDIRECT /NOVESA /DEBUG /BAUDRATE=115200

   c. EfiOsLoaderFilePath = cf5f2ddc-b885-11d7-b831-000000000000 :: \efi\microsoft\winnt50\ia64ldr.efi

   d. OsLoaderFilePath = e605a034-b885-11d7-b831-000000000000 :: \windows

6. Exit and boot the OS.

Enable Terminal Services after OS Re-installation

If the DVD Restore is performed under a headless configuration, another step needs to be performed after you login to the system with terminal services.

1. Wait until the GUI setup state is completed and the OS reboots.
2. From the SAC prompt, assign an IP address for one of the NICs.

   If you do not have a DHCP server, obtain the IP address to connect with the terminal server services. Please note that the "I" command can also be used to change the IP Address to match your network. However, this change only works temporarily. The user must go to the Network properties page and change the IP address parameters there and save it for the values to be permanent.

   SAC>I Net: 2, IP=192.168.0.255 Subnet=255.255.255.0 Gateway=192.168.0.1

   Open Windows XP or Windows 2000 terminal server client and connect to 192.168.0.255 and change the computer name and IP address if needed.
3. From the remote desktop, log on to SD64A via the NIC that you just assigned the IP address.

Launch Remote Desktop Connection on the Client

1. Launch Remote Desktop (usually located in the Accessories Communication).
2. Enter the "IP address of the LAN on the server system that connects to the corporate network or computer name.
3. Enter the Administrator name and the password in the User name and password boxes.

How to Install and Run the Microsoft Debugger

For additional information go to the Microsoft website at
http://www.microsoft.com/whdc/ddk/debugging/default.mspx

Refer to the debugger documentation for setting up a kernel debug client.

I/O Slot Translation

Slot numbers displayed by Windows in the hardware device manager and the system tray include the full I/O path, in addition to the slot number silk-screened on the I/O chassis. The format of the slot number is as follows:

For the HP Integrity Server:

CBHSS

Key:
C – Cabinet number
B – Bay number
H – I/O Chassis Number
SS – Two digit slot number in decimal form

NOTE: Windows suppresses leading zeroes, therefore, these digits will not appear, but are otherwise 0. However, manageability agents display the full path of the I/O cards in a more descriptive form.

Example: PCI Slot 80101

C = “8” = I/O Cabinet #8
B = “0” = bay #0
H = “1” = Chassis #1
SS = “01” = PCI Slot #1

For the HP Integrity rx8620/rx7620 server:

Example: PCI Slot 101

H = “1” = Chassis #1
SS = “01” = PCI Slot #1

Console Access from the Windows Terminal Server

To view a console from Windows Terminal Server, run

```
mstsc.exe /console.
```

How to Edit Non Volatile RAM settings from within Windows

To edit NVRAM settings from within the Windows OS, go to a command prompt and type:

```
Bootcfg /?
```

Description

This command line tool allows an administrator to configure, query, change or delete the boot entry settings in the NVRAM.

Parameter List

/Copy Makes a copy of an existing boot entry.

/Delete Deletes an existing boot entry from the NVRAM.

/Query Displays the current boot entries and their settings.

/Raw Allows the user to specify any switch to be added to a specified boot entry.

/Timeout Allows the user to change the Timeout value.

/Default Allows the user to change the Default boot entry.

/EMS Allows the user to configure the /redirect switch for headless support.

/Debug Allows the user to specify the port and baudrate for debugging.

/Addsw Allows the user to add predefined switches.

/Rmsw Allows the user to remove predefined switches.

/Dbg1394 Allows the user to configure the 1394 port for debugging.

/Mirror Allows the user to add information about a mirrored drive.

/List Allows the user to List information about a drive.

/Update Allows the user to update Partition information on a drive.

/Clone Allows the user to clone a boot entry on a drive.

/? Displays this help message.

You can get further information on each command by typing bootcfg /Parameter /?.

Accessing the EFI Partition from within the Windows OS

From a command prompt, type:

```
mountvol x: /S
```

This will map your x:\ drive as the efi partition. This will allow you to move files and data between your Windows partitions and your efi partition. Note that only one EFI partition can be mapped.

Default VGA Controller

On a cellular system if a partition has multiple VGA cards then the supported VGA card should be on the root cell.

On a non-cellular system make sure that the default VGA is enabled in the Active Console Output Devices of the boot option Maintenance menu.

To check the root cell, at the EFI Shell> type the command: `ROOTCELL`. This command will display the root cell number. To determine what I/O chassis is attached to the root cell type **`info io`** at the efi prompt.

How to Turn on the Terminal Services Key if it is Accidentally Turned Off

Windows is supported in a headless configuration (without a VGA graphics adapter). In lieu of connecting to the VGA console, it is possible to use terminal services. This is enabled by default in the preloaded Windows installation. If, however, this is turned off accidentally, it can be turned on in the graphic mode through the My Computer “Remote” tab. In the headless mode, however, the registry must be changed. For instructions on modifying the registry using the command channel see the “Remote Control Session: Launch Remote Desktop” section.

NIC Driver Upgrade

When upgrading your NIC driver, proceed to do so through Windows, but before upgrading make a note of the IP Address of your backbone NIC. Noting the address is critical, because the backbone NIC is often assigned an IP address through DHCP, and can potentially be re-assigned a new address at the time of the driver re-install. After you have noted this address, proceed with your upgrade. Knowing the address will ensure that you can connect to the backbone NIC after reboot of the server.

Activation of the Administrative Session via Terminal Services

When using the terminal server as an access to the graphics console, you must specify the /console switch to the terminal service client (mstsc.exe), as system events and certain dialogs are only sent to that session, and not other remote administration sessions.

Adobe Acrobat Reader version 6.0 does not display PDF documents in Internet Explorer on a 64-bit system

Issue: When using Smart Setup to review PDF documents in the 64-bit system via Internet Explorer, PDF files will not display successfully in Adobe Acrobat Reader 6.0.

Workaround: Either open Smart Setup in the 32-bit version of Internet Explorer, or have Acrobat Reader 6.0 open PDF files in a separate window. This is done by following the steps below:

1. Open Acrobat Reader using the Edit menu.
2. Select **Preferences.**
3. Choose **Internet preferences.**
4. Clear the option **Display PDF in browser**.
5. Choose **OK** to save changes, and exit.
6. Restart Internet Explorer and PDF files will display successfully.

Adobe Acrobat Reader 6.0 does not support Microsoft Windows Server 2003

Issue: If you download Adobe Acrobat Reader 6.0 from the Adobe website you will not see the Microsoft Windows Server 2003 OS listed in the platforms available.

Workaround: Download the Adobe Acrobat Reader from Adobe's Text-only download page. This allows for a general Windows install of the reader. HP recommends the usage of version 5.5 or lower on an HP Integrity server.

SCSI Parity Error

Issue: Configurations that include the SCSI attached DVD drive integrated into the TA5300 tape array will generate the following Event ID 5 message in the System Event Log, "A parity error was detected on \Device\Scsi\sym_u31." The event will be generated when re-booting the server and may be generated during run time.

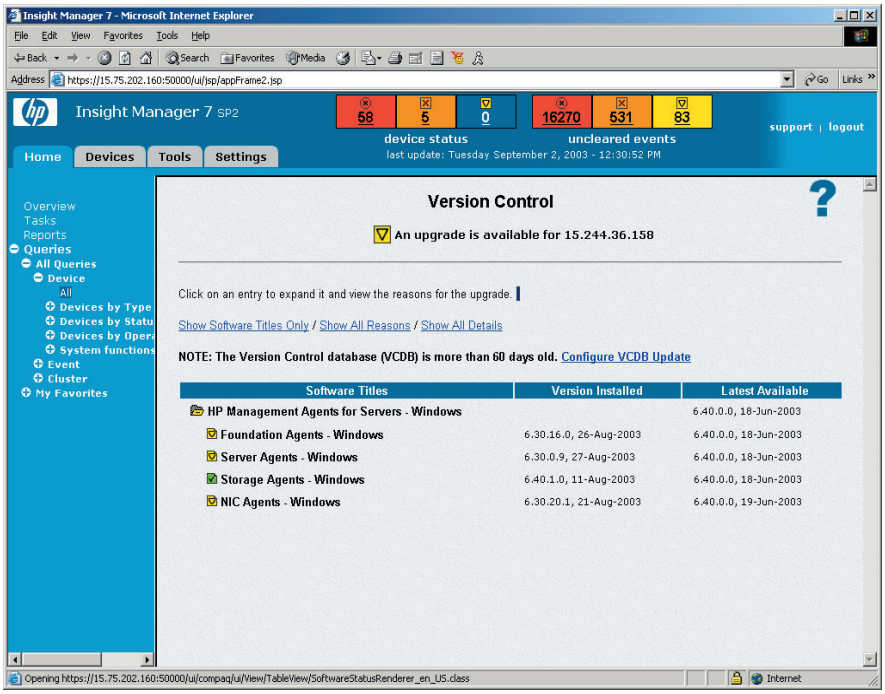
Workaround: No action is necessary. This message has a severity level of "Error" but does not impact system integrity or performance.

Legacy Version Control

Issue: Insight Manager 7 incorporates a feature called Legacy Version Control. This feature has a repository containing the latest software such as HP Management Agents for Microsoft Windows Servers. If the HP Management Agents are installed on an HP Integrity Server with Windows Server 2003 64-Bit OS, the Legacy Version Control will display an upgrade is available message when the version installed is older than the one on the Version Control Database.

The upgrade status is incorrect as displayed in the figure below. The Legacy Version Control feature is not supported on HP Management Agents version up to 2.2 release. However, the feature will be supported on the next Version Control Data Database update.

Workaround: Do not use the Legacy Version Control feature.



Launching the HP Insight Storage Agents and the Array Configuration Utility

Issue: When viewing the driver properties in the device manager for the Smart Array 6400 Controller, an enhanced Tools menu bar is displayed. This menu bar provides a radio button to launch the HP Insight Storage Agents and the Array Configuration Utility. Neither of these buttons function in this release of the driver.

Workaround:

The preferred method to launch the HP Storage Agents is:

1. Open the **Administrative Tools start menu shortcut** and open **Services**. (This is also available by clicking **Start>Settings>Control Panel>Services**.)
2. Locate the entry named **HP Insight Storage Agents**.
3. Right-click the entry and select **Start**.

The preferred method to launch the Array Configuration Utility is:

1. Click **Start.**
2. Click **hp System Tools.**
3. Click **hp Array Configuration Utility XE**.

NOTE: To use ACU you must use Internet Explorer 32bit under “Program Files X86” in the start menu.

The LSI SCSI Agent does not return Device Information when more than 16 HBAs are attached

Issue: The maximum number of HBAs supported by the SCSI Agent is 16. If you have more than 16 HBAs installed, the Agent will only report the SNMP information about the first 16. Also, if more than 16 HBAs are installed, the Agent will not return ANY SCSI Device information at all. From the Agent point of view, an HBA is a single port of a SCSI card. If you have a dual-port 1010 SCSI card, this is seen as 2 HBAs. So having 8 dual port SCSI 1010 cards installed is equal to having 16 HBAs.

Workaround: Currently, the only workaround is to not install more than 16 HBAs.

Adding additional SCSI controllers may cause the SNMP service to stop

Problem: If additional SCSI 1010 controllers are installed, the SNMP service may terminate by itself when the system is restarted.

Workaround: Open the service control manager. Stop and start the HP Insight Agents Services. Start the SNMP service. The Agents should now operate normally.

Troubleshooting Tips for Configuring Windows

This section provides information about known issues, solutions and workarounds.

Tip 1. Importing Boot Options into the EFI Boot Manager

NOTE: When Windows is installed data is stored in NVRAM that enables that version of Windows to be booted from the EFI boot Manager. If NVRAM is cleared or corrupted this data must be imported back into NVRAM to enable EFI boot Manager to offer this boot option. To import boot data back into NVRAM follow the instructions below.

If an entry in the EFI boot manager menu no longer points to your windows install…etc – see DC doc – if NVRAM gets corrupted, explain why to do this. (Greg's inputs into the DC section)

1. Ensure the boot drive is in the server.
2. Boot the system and go to the EFI Shell.
3. Access the image directory, for example, `Shell > fs0:`
4. Enter the command:

   ```
   DIR
   ```

5. Enter the command:

   ```
   CD MSUTIL
   ```

6. Enter the command:

   ```
   NVRBOOT
   ```

NOTE: NVRBOOT.EFI is a hidden file.

7. Select **I** option to import the OS loader of the image to the server's NVRAM.
8. Type the path of the boot file, for example: `\EFI\mircosoft\winnt50\boot0000.`
9. When completed, the boot option displays on the EFI boot menu.

Tip 2. How to Boot Microsoft Windows Server 2003 to Safe Mode Without Using F8

This tip explains how to configure Microsoft Windows Server 2003 to SAFE boot on the HP Integrity server. It provides two ways of implementing the objective. One is manually using NVRBOOT.EFI to create the entries. The other method is semi-automatic using WINPE environment with a batch file safeboot.cmd to make the entries and NVRBOOT.EFI to edit the entries.

You will need to add two EFI boot manager entries to allow the server to boot to Safe Mode. Two methods for accomplishing this objective are described below:

1. Using the EFI environment by running NVRBOOT.EFI (Microsoft tool).

2. Using the WINPE environment by running a batch file which calls EFINVR.EXE (Microsoft tool).
3. Additionally, when the OS is starting, a message will display "starting windows…..". You can press **F8** at this time to boot to safe mode.

NOTE: The HP Re-install media provided by the hardware manufacturer does not make any of these safe-boot entries. The default is still the same as Microsoft Windows Server 2003.

METHOD #1: Using EFI environment by running NVRBOOT.EFI

Create the EFI boot manager entry for /safeboot **minimal,** as follows:

1. Boot to the EFI prompt.
2. Run the nvrboot.efi utility (nvrboot.efi file is hidden and located in the EFI partition).
3. Copy the existing Microsoft Windows Server 2003 entry to a new entry.
4. Modify the **1. LoadIdentifier** option to a more descriptive name, such as **Microsoft Windows Server 2003 Safe-Boot Minimal.**
5. Modify the load options on the new entry to read as follows:

   ```
   /safeboot:minimal /sos /bootlog /redirect
   ```

6. Exit nvrboot.

METHOD #2: Using the WINPE environment by running a batch file that calls EFINVR.EXE

The only tool available from EFINRV.EXE to make an EFI boot manager entry does not allow you to pass the entry description or **1. LoadIdentifier.**

1. Boot the WinPE Re-install media. (Version 1.6J or later).
2. Open a command prompt.
3. Enter the `safeboot.cmd` command. This will create the two EFI boot manager entries listed above. These entries will be at the bottom of the EFI boot manager list. However, the entry description for both of these needs to be changed.
4. Exit WinPE and boot to the EFI environment.
5. Run nrvboot and modify **1. LoadIdentifier** for both entries. We recommend **`Error! No document variable supplied.`** `Safe-Boot Minimal` for one, and `Microsoft Windows Server 2003 Safe-Boot Network` for the other one.

The following screen examples show sequentially what the boot manager displays after the entries are made:

```
EFI Boot Manager ver 1.10 [14.56] Firmware ver 80.10 [4216]
Please select a boot option
   Microsoft Windows Server 2003
   DVD CD
   EFI
   Microsoft Windows Server 2003 Safe Mode Minimal
```

```
   Microsoft Windows Server 2003 Safe Mode Network
   Boot option maintenance menu
   Security/Password Menu
```

The following is a screen example of the nvrboot.efi display option:

```
NVRBOOT: OS Boot Options Maintenance Tool [Version 5.1.3550]
    * 1. Microsoft Windows Server 2003
     2. DVD CD
     3. EFI
    * 4. Microsoft Windows Server 2003 Safe Mode Minimal
    * 5. Microsoft Windows Server 2003 Safe Mode Network


    * = Windows OS boot option


     (D)isplay (M)odify (C)opy E(x)port (I)mport (E)rase (P)ush (H)elp
    (Q)uit


    Select> d

    Enter boot option to display: 4

    1. LoadIdentifier = Microsoft Windows Server 2003 Safe Mode
    Minimal

    2. OsLoadOptions = /safeboot:minimal /sos /bootlog /redirect

    3. EfiOsLoaderFilePath = 006F0073-0066-0074-5C00-570049004E00 ::
    \EFI\Microsoft\

    WINNT50\ia64ldr.efi

    4. OsLoaderFilePath = 8EB50004-ABB1-47EF-5DB8-BF7695FC883A ::
    \WINDOWS


    Press enter to continue


     (D)isplay (M)odify (C)opy E(x)port (I)mport (E)rase (P)ush (H)elp
    (Q)uit



    Select> d

    Enter boot option to display: 5

    1. LoadIdentifier = Microsoft Windows Server 2003 Safe Mode
    Network

    2. OsLoadOptions = /safeboot:network /sos /bootlog /redirect

    3. EfiOsLoaderFilePath = 006F0073-0066-0074-5C00-570049004E00 ::
    \EFI\Microsoft\

    WINNT50\ia64ldr.efi
```

```
4. OsLoaderFilePath = 8EB50004-ABB1-47EF-5DB8-BF7695FC883A ::
\WINDOWS
```

Tip 3. Terminal Service is Set Up to Run in Administrator Mode by Default

By default, the Windows Terminal Service is enabled in Remote Administration mode on all installations of Microsoft Windows Server 2003. To set up Terminal Service to run in Application Mode follow the instruction on "Adding Terminal Server Services."

NOTE: Terminal Server Service does not allow two users with the same logon name to log in at the same time.

Tip 4. Blank Passwords and Local User Accounts

Microsoft Windows Server 2003 has a new default security feature that helps protect users with blank passwords from attacks. Users who do not password-protect their accounts can only logon to their account at the Welcome (Winlogon) screen on the physical computer console (monitor, keyboard, mouse physically connected to the computer). This restriction applies to all logon types, not just network logon. For example, you will not be able to use RunAs to run a process as an account with a blank password. This restriction only applies to local user accounts, and not to domain user accounts. It also does not affect the guest account. Domain controllers will ignore this option, since it doesn't apply to domain accounts. This feature is configurable through Local Security Policy, or through Domain Policy.

Tip 5. Using Diskpart.efi to Partition a New GPT Drive

Diskpart.efi is a utility available on the HP Smart Setup media through the EBSU. The Microsoft Windows Server 2003 FORMAT command cannot be used to format an EFI partition created by Diskpart.efi. The efifmt.efi can format a disk partition created by Diskpart.efi.

Tip 6. Using the Windows Diskpart Tool

You can access the online help and run the OPK tool from within the OS.

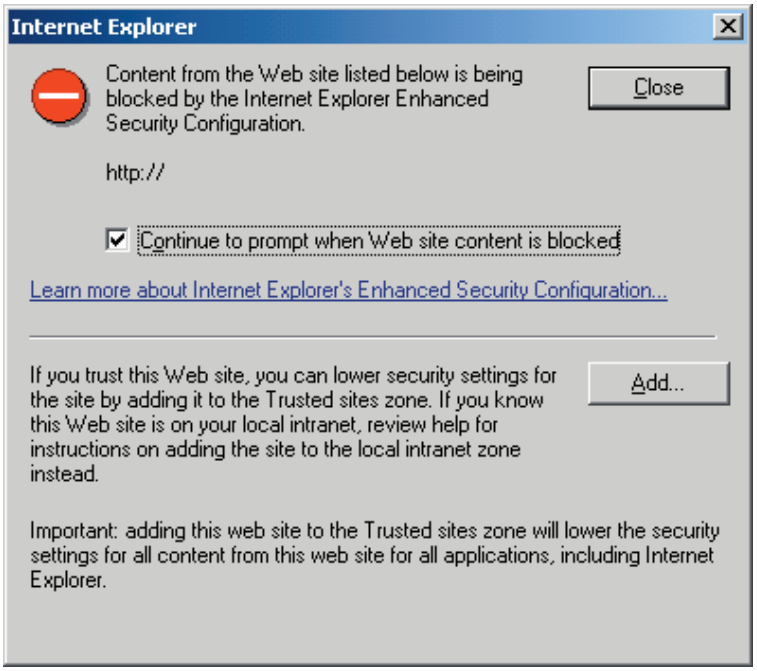
1. Boot from the re-install media.
2. Open a command prompt by clicking **Advance**.
3. Run **diskpart.exe**
4. Type `help` at the diskpart menu:
   DISKPART>help
5. Follow the on-screen instructions.

Tip 7. The HP Array Configuration Utility (ACU) Displays Security Warning Messages Correctly When Using Microsoft Internet Explorer 6.0 Shipping with Microsoft Windows Server 2003

Microsoft Windows Server 2003 ships with a slightly modified version of Microsoft Internet Explorer 6.0 that differs in the way it categorizes targeted server sites into security zones. In previous releases of IE 6.0, servers on local intranets defaulted to belong to the Local Intranet Zone, with a relaxed set of default security settings. In this new version of Internet Explorer 6.0, all servers default to the Internet Zone which defaults to the highest level of security settings. If the HP Array Configuration Utility is used while the site is still categorized in the Internet Zone, security warning messages will be displayed.

NOTE: To use ACU you must use Internet Explorer 32bit under Program Files X86 in the start menu.

If you are running the Array Configuration Utility in Local Application Mode (this mode does not use a web server and is the default execution mode for ACU 6.40 and later), you will get the following security warning message in Internet Explorer:



If you are running the Array Configuration Utility in Remote Service Mode (this mode uses a web server and allows the ACU to be accessible from remote systems using the System Management Homepage), numerous security warning messages will be displayed until the Don't Show Me This Anymore box is checked or the targeted server is manually added to the browser's Local Intranet zone.

If you use an IP address in the URL instead of the server name, Internet Explorer will show the following security warning:

```
Information you exchange with this site cannot be viewed or
changed by others. However, there is a problem with the site's
security certificate:
```

```
The name on the security certificate is invalid or does not match
the name of the site. Do you want to proceed?
```

This problem impacts ACU 6.40 on any version of Microsoft Windows Server 2003 with Internet Explorer 6.0. The solution is given below.

If you are running the Array Configuration Utility in Local Application Mode (this mode does not use a web server and is the default execution mode for ACU), you need to add the local ACU to the Trusted Sites zone:

1. Click **Add** on the security warning to bring up a screen which allows you to add sites to the Trusted Sites zone.
2. Click **Add** to add http:// to the Trusted Sites zone. This step will add http://*.0.0.0.0 to the list of trusted sites and will allow the ACU to run in Internet Explorer properly without using a web server.
3. Click **Close.**

If you are running Array Configuration Utility in Remote Service Mode (this mode uses a web server and allows the ACU to be accessible from remote systems using the System Management Homepage), check the Don't Show Me This Anymore box on the security warnings that appear and add the desired target servers to the Local Intranet Zone by performing the following steps:

1. Click **Tools** from the Internet Explorer 6.0 pulldown menu.
2. Select **Internet Options** and select the **Security** tab.
3. Click on the **Local Intranet** icon, then select **Sites>Advanced.**
4. Manually enter the target servers in the Local Intranet Zone in the following format:

```
http://<SERVERNAME IPaddress>:2301
OR
https://<SERVERNAME IPaddress>:2381
```

If accessing the Array Configuration Utility using an IP address in the URL, click **Yes** on the security warning to proceed.

NOTE: JavaScript must be enabled in Internet Explorer to run the Array Configuration Utility. JavaScript is enabled with Internet Explorer's default security level of the Trusted Sites zone and Local Intranet Zone.

Tip 8. How to Enable Video Mode to Display/Output in an EFI Environment

EFI Boot Manager version 1.10 [14.61]

1. Select a boot option.

```
Windows Server 2003, Enterprise
EFI Shell [Built-in]
Boot option maintenance menu
```

2. Select Boot option maintenance menu.

EFI Boot Maintenance Manager ver 1.10 [14.61]

1. From the main menu, select an operation.

```
Boot from a File
Add a Boot Option
Delete Boot Option(s)
Change Boot Order
Manage BootNext setting
Set Auto Boot TimeOut
Select Active Console Output Devices
Select Active Console Input Devices
Select Active Standard Error Devices
Cold Reset
Exit
```

2. Highlight Select Active Console Output Devices. Then press **Enter**.

EFI Boot Maintenance Manager ver 1.10 [14.61]

1. Select the Console Output Device(s).

```
Acpi(000222F0,0)/Pci(0|0)/Uart(9600 N81)/VenMsg(PcAnsi)
      Acpi(000222F0,0)/Pci(0|0)/Uart(9600 N81)/VenMsg(Vt100)
  * Acpi(000222F0,0)/Pci(0|0)/Uart(9600 N81)/VenMsg(Vt100+)
      Acpi(000222F0,0)/Pci(0|0)/Uart(9600 N81)/VenMsg(VtUtf8)
      Acpi(000222F0,8)/Pci(1|0)/Pci(5|0)
  Save Settings to NVRAM
  Exit
```

2. Select **Acpi(000222F0,8)/Pci(1|0)/Pci(5|0).**
3. Press the space bar once to select the option. Save settings to NVRAM and then exit.

Tip 9. To Configure Large Configuration Systems To Save OS Memory Dumps

Windows offers the ability to manage the page file. At pre-load, a custom page file size is chosen based on the amount of memory configured into the partition. The page file size may be subsequently changed or additional page files configured for performance reasons. Windows will try and use page files that are not resident on the system disk if more than one page file exists. Page file usage may be monitored using the Task Manager or System Monitor.

Windows can also be configured to save a memory dump on failure. Kernel memory dumps and full memory dumps both use the system page file as a temporary storage device and the page file must therefore be of sufficient size. For systems configured with up to 2Gb of RAM, the page file on the system disk must be set to the size of physical ram +12Mb to save a full memory dump and about half of this to save a kernel dump. Under Windows 2003, the full dump option is not available if the system has more than 2Gb of RAM installed. HP recommends that administrators increase the page file on the system drive to the lesser of 20% of the total physical memory or 20Gb. In all cases the Initial size for the page file on the system disk should match the Maximum size in order to save a memory dump.

After a failure and a system reboot, the memory manager will copy the memory dump from the system page file to a location specified by the administrator. This location must be on a locally attached disk which must be monitored to ensure there is enough free space to hold the memory dump. Subsequent memory dumps will overwrite each other.

To increase the page file size:

1. Right-click My Computer, then Properties
2. Select the Advanced tab, then Performance Settings.
3. Select the Advanced tab, then Virtual memory Change.
4. Under Drive, select the volume where the page file will be located.
5. Under Paging file size for selected drive, select Custom size and set the size to 20GB.

   Selecting **System managed size** will result in Windows sizing the page file to the recommended size. If this is too large, select **Custom size** and set the size to 20% of physical memory. For example, if the system has 512 GB of physical memory, set the size to 102500 MB.
6. For the page file on the system disk, ensure the initial is set to the same value as the maximum size.
7. Click **OK** until you are at the System Properties Dialog. Then click **Startup and Recovery Settings**.
8. There will be typically three choices for **Write debugging information, None, Small Memory Dump, and Kernel memory dump.**

If there is not enough disk space on the system disk to satisfy the 20% size recommendation, select the largest size possible and retain the kernel memory dump setting. The small memory dump does not normally contain sufficient information to be able to identify a root cause for a system failure. However, they can be useful to identify whether a series of failures might be all due to the same root cause and have the advantage that they can be easily emailed.

Creating a Dump on an Unresponsive System

HP recommends to exercise caution when performing this action since it results in system failure requiring a soft reset. If a system is unresponsive, a kernel memory dump can be created using either of two methods:

1. Using the SAC 'crashdump' command. At the SAC prompt, type `crashdump`. The SAC display will be updated to reflect a fatal system error - "0x000000E2 – Manually Initiated Crash," and will indicate that a dump of physical memory is being created. Under certain conditions, CEs may observe a different bugcode – "0x0000000A - IRQL_NOT_LESS_OR_EQUAL." This is a known issue and will still result in a valid crash dump being created.
2. Using the MP, enter the Command Menu – 'cm'. To initiate the dump, use the 'tc' command. The SAC display will be updated to reflect a fatal system error – "0x000000E2 – Manually Initiated Crash," and will indicate that a dump of physical memory is being created.

System Restore Media and Page Files

Issue: Using the 16GB option will result in an inability to create a kernel memory dump in the event of system failure unless the page file size is manually configured afterward.

Workaround: The system partition must be created on a 32GB or larger disk drive. When using the reinstall media, administrators and CE's should use either 32 GB or 'max drive size' options when configuring the system volume. Additionally, manual configuration of the page file size, when using the 16GB option, will still result in a page file size of less than 20 GB, which is the minimum recommended size.

On-Line Information and Software Sources

HP Integrity Servers site: http://www.hp.com/support/itaniumservers

HP Internet website: http://www.hp.com

Microsoft World Wide Web access: http://www.microsoft.com

Register for Alerts and Notifications

HP recommends that customers sign-up and register for your alerts and notifications. HP driver and support alerts will keep you up to date with information customized to your product and frequency needs. Please go to

http://www.hp.com/go/subscriberschoice

Register for Microsoft Security Bulletin Notification Service

HP recommends that customers sign-up for the Microsoft security bulletin notification service at

http://www.microsoft.com/technet/security/bulletin/notify.asp

Register for Windows Update

HP recommends that customers use the Microsoft Windows Update feature to keep their system secure. Please go to

http://v4.windowsupdate.microsoft.com/en/default.asp